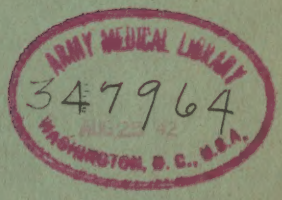
Eradication of Tuberculosis in Syracuse

Report of the

Mayor's Conference Committee on Tuberculosis



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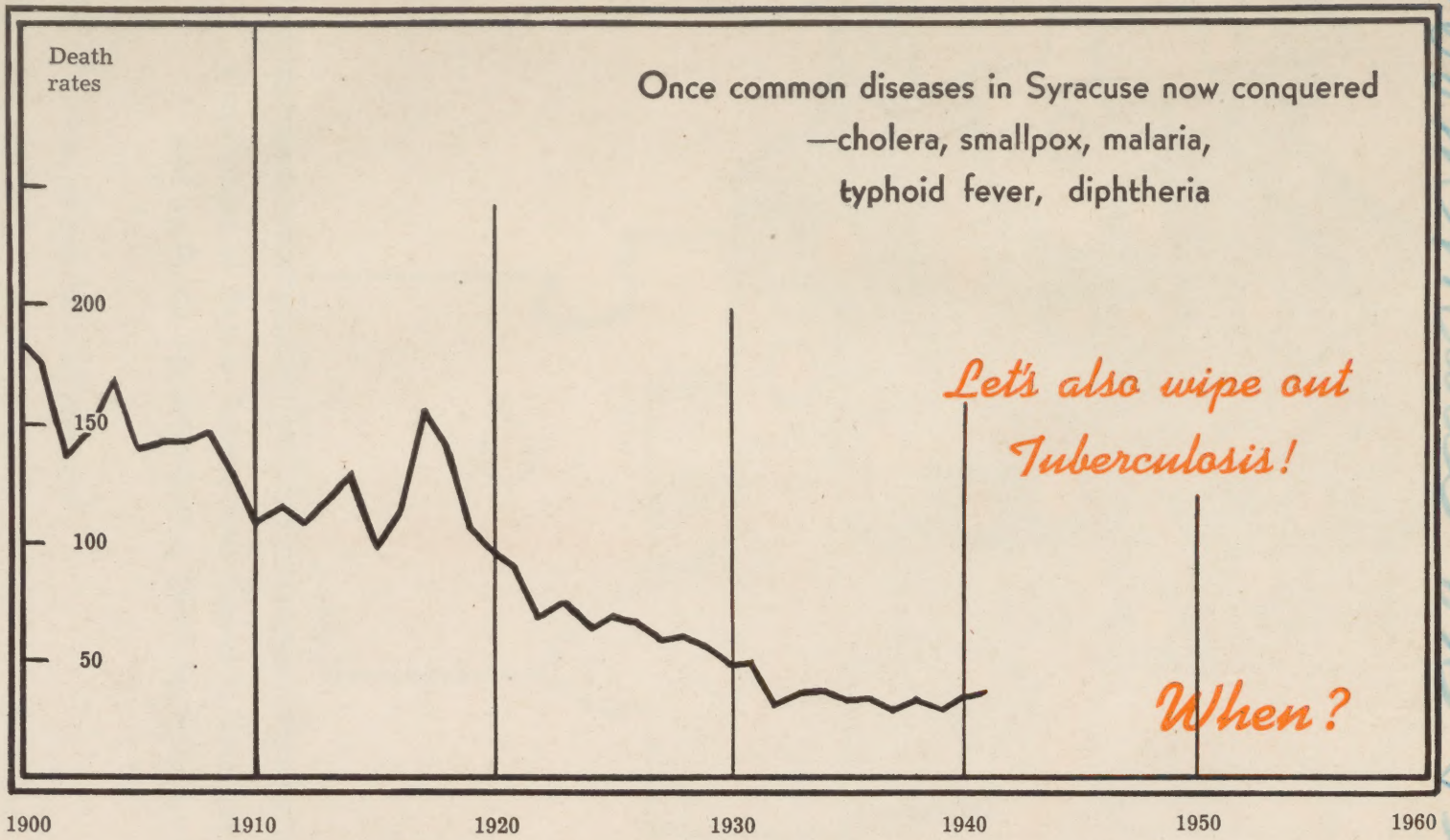
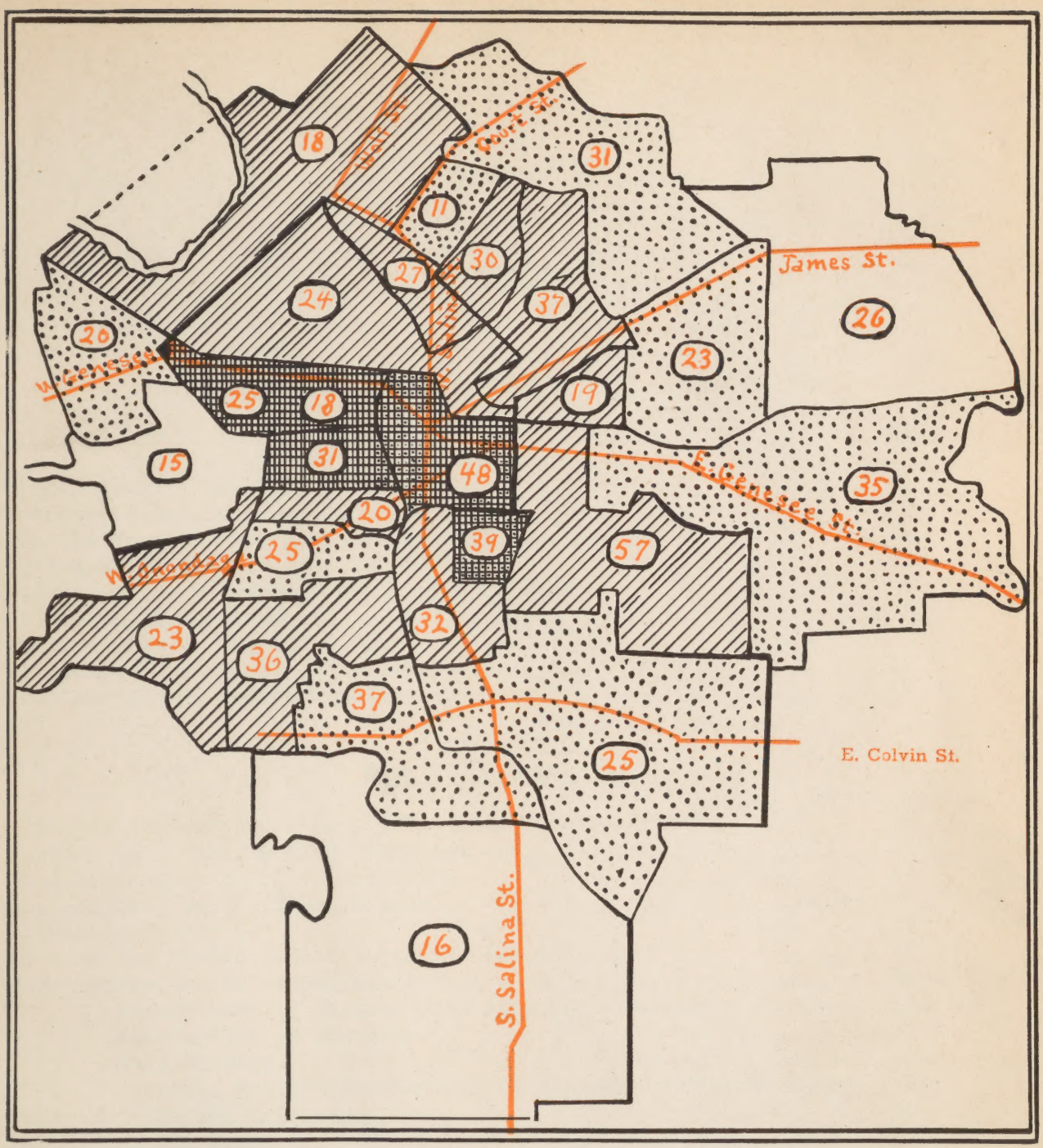


Decline in Tuberculosis Death Rates in Syracuse by Years

"Why tolerate so costly a disease as tuberculosis for another half century, when it can be substantially eradicated within two decades by a much greater concentration of efforts."

State Committee on Tuberculosis and Public Health



Distribution of Active Tuberculosis Cases in Syracuse by Residence and by Public Health Nursing Districts, February 22, 1942

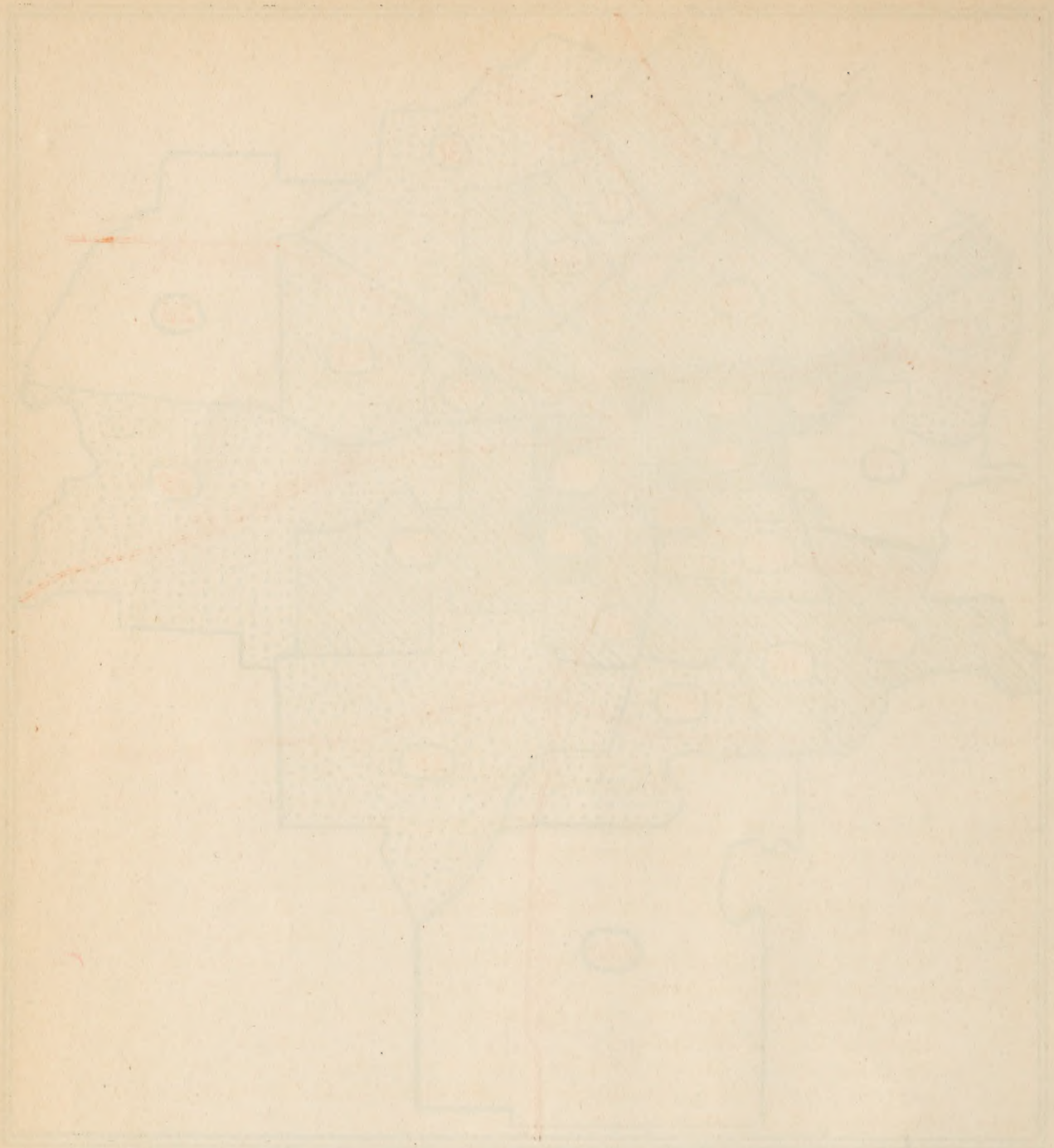
— 1 case per each 100 to 199 population

— I case per each 200 to 299 population

— 1 case per each 300 to 399 population

— 1 case per each 400 to 599 population

Orange figures show number of persons residing in each district who had tuberculosis. Some of them were in hospitals, and some were at home.



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ERADICATION OF TUBERCULOSIS IN SYRACUSE

Report of the Syracuse Conference Committee on Tuberculosis *

Submitted to Mayor Thomas E. Kennedy and the People of Syracuse

PART I. - BACKGROUND FACTS ABOUT TUBERCULOSIS

Appointment of the Committee

After over 30 years of increasingly successful warfare against tuberculosis, public health authorities and leading medical and other organizations in New York State launched a carefully thought-out program, early in 1941, to reduce this ancient plague to a point where it will be practically exterminated from the Empire State by 1960. In other words, the plan calls for getting rid of this serious, highly costly, and wholly unnecessary disease within one generation.

The program is sponsored by a specially created State Tuberculosis Conference Committee appointed by State Health Commissioner Edward S. Godfrey, Jr., M.D., and made up of representatives of the State Health Department, the Medical Society of the State of New York, the State Committee on Tuberculosis and Public Health of the State Charities Aid Association, the

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* The members of the Syracuse Committee as originally named were Commissioner Leon H. Abbott of the County Welfare Department; Dr. Eugene W. Bogardus, superintendent, Onondaga Sanatorium; Dr. Donald S. Childs, president, Syracuse Academy of Medicine; Miss Cathlena A. Cooper, R. N., director, Visiting Nurse Association; Commissioner H. Burton Doust, City Health Department; Dr. William A. Groat, chairman, City Advisory Committee on Public Health; Dr. Gordon D. Hoople, chairman, Health Committee, Chamber of Commerce; James Jaffee, Syracuse Central Trades and Labor Assembly; Dr. Robert D. Johnson, director, Tuberculosis Bureau, City Health Department; T. Aaron Levy, president, Onondaga Health Association; Miss Agnes J. Martin, R. N., director, Bureau of Nursing, City Health Department.

Dr. O. W. H. Mitchell, chairman Health Division, Council of Social Agencies who is also a member of the State Conference Committee; Carl A. Ostling, Manufacturers Association; Dr. Philip J. Rafle, district state health officer; Dr. E. C. Reifenstein, professor of medicine, College of Medicine, Syracuse University; Arthur W. Towne, secretary, Onondaga Health Association; Dean Herman G. Weiskotten, College of Medicine. Mr. Jaffee, Mr. Ostling and Dr. Rafle moved away from Syracuse. Mr. Jaffee and Dr. Rafle were succeeded by Albert L. Halbritter and Dr. Edward B. Bukowski, respectively. Dr. C. George Murdock of the County Medical Society was also added to the Committee.

Commissioner Doust was chosen as the chairman of the Committee.

Metropolitan Life Insurance Company, the State Department of Mental Hygiene, and the State Department of Social Welfare. The enterprise has the support of Governor Lehman, and pledges of cooperation from all parts of the State.

The Syracuse Conference Committee on Tuberculosis was created by Mayor Rolland B. Marvin in 1941 at the request of Commissioner Godfrey, who asked the mayors of other cities of comparable size to appoint a similar committee. The local Committee has a membership of eighteen persons representing thirteen local departments and organizations.

The duties assigned to the Syracuse Committee were, in brief, (1) to study the local tuberculosis situation and the existing facilities for the control of this disease; (2) to make recommendations as to the most effective use of the present services and as to any needed changes or expansions, and (3) to interpret both the state and the local tuberculosis eradication programs to the public and to urge such citizen support and official action as may be required.

The present Report is intended mainly for persons interested in obtaining a comprehensive, detailed picture of the local tuberculosis situation and needs. The Committee has felt it desirable to compile a descriptive and interpretive statement of this kind, both as a program of needed action, and as a permanent source of reference and an important chapter in the health history of our city.

The Committee is also publishing a brief summarized Report for the general public, entitled, "Getting Rid of Tuberculosis in Syracuse."

Downward Trend of Tuberculosis

Since the beginning of the present century, tuberculosis has everywhere been declining in both prevalence and mortality. The reported tuberculosis death-rates throughout the United States and throughout upstate New York during the first four decades of the present century fell approximately 75 per cent.

In Syracuse the annual tuberculosis death-rate during this 40-year period declined about 80 per cent. That is, it fell to about one-fifth of what it was at the beginning of the century.

Topping all other causes of death, tuberculosis during the latter part of the last century used to kill from 200 to 250 out of every 100,000 inhabitants of the city each year. One-tenth of the population were in those days doomed to die, eventually, from this captain of the men of death.

The downward trend in the tuberculosis mortality in Syracuse is strikingly shown in the chart at the front of this Report, and also in the following table.

It is always more satisfactory to make comparisons in death-rates on the basis of some given period of years, rather than on the basis of rates for a single year.

Five-year periods	Average death-rates
1887 - 1891	252 *
1892 - 1896	222 *
1897 - 1901	205
1902 - 1906	146
1907 - 1911	128
1912 - 1916	114
1917 - 1921	118
1922 - 1926	68
1927 - 1931	55
1932 - 1936	35
1937 - 1941	33

Tuberculosis has fallen from first rank as a cause of death in our city at the beginning of the century to eighth rank in 1941. Following are the number of deaths and the death-rates from the present leading eight causes, and also their relative ranks.

Causes	Deaths in 1941	Death-rates in 1941	Rank in 1941
Heart diseases	864	422	1
Cancer	333	162	2
Cerebral hemorrhage	196	96	3
Accidents	179	88	4
Nephritis (Bright's disease)	138	67	5
Pneumonia	109	53	6
Diabetes	97	47	7
Tuberculosis	84	41	8

Thanks to this decreased mortality from tuberculosis, thousands of Syracusans who would have died if former rates had continued, are today alive and going about their work. Yet in spite of this marked reduction in tuberculosis mortality, this disease killed 1 person every 4½ days. Tuberculosis, for reasons which will later be more fully explained, still constitutes our most challenging public health problem.

The record of Syracuse in combating tuberculosis has been so outstanding in comparison with what has been done in other cities, as to have won national recognition. In the light of this history, as well as because of our excellent public health organizations, our progressive medical profession, and the health-mindedness of our people, Syracuse is in an enviable position for achieving further advances. Dr. Louis I. Dublin, vice-president and statistician of the Metropolitan Life Insurance Company and former president of the American Public Health Association, in a recent address in Syracuse dealing with the problem of tuberculosis elimination, declared, "I know no large community where the stage is better set for such an accomplishment."

Through the application of medical science and the enlistment of citizen interest, Syracuse has virtually, or completely, banished certain diseases, like cholera, smallpox, typhoid fever, malaria, and diphtheria, which used to take heavy toll in human lives. Tuberculosis is equally preventable. In the words of State Commissioner Godfrey, "Tuberculosis must be the next to go."

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* The statistics from 1883 through 1893 included only the pulmonary form of tuberculosis.

What Is Meant by the Eradication of Tuberculosis

Certain diseases like smallpox and the others just mentioned, formerly prevalent in Syracuse and upstate New York, have in recent years become so rare as to be spoken of as having been wiped out. This does not mean that they have been totally and forever abolished, for sporadic cases may still occur. What it means is that the incidence of these once common diseases has become so extremely small as to make them, from the public point of view, a very minor and almost negligible problem.

The use of the term "eradication of tuberculosis" is to be similarly interpreted. The State program to attain this goal by the year 1960 is an endeavor to make tuberculosis deaths so infrequent after that date that the disease may be said to be practically done away with.

Unquestionably after control has been accomplished, there will now and then be an occasional death from tuberculosis, particularly among older persons and among persons with advanced tuberculosis moving into New York State and into Syracuse from other places.

Is there any measurable way, then, of determining at what precise point we may properly declare tuberculosis to have been practically eradicated, in the foregoing sense? Answering this query, State Health Commissioner Godfrey and other competent authorities have declared that such a point will be reached when the annual mortality-rate falls to 5 or less deaths per 100,000 population, and does not thereafter rise above this level. Once such a record is established, the incidence and the mortality of the disease may reasonably be expected to approach closer and closer to its final disappearance.

Influence of the War upon Tuberculosis

What effect will the present war conditions have upon the tuberculosis situation? Warfare on an extensive scale has always been attended by a marked upsurge in tuberculosis. This is what happened in both Europe and America as a by-product of the First World War. In the present international upheaval, tuberculosis has already strikingly increased in England, Canada, and other countries. Under the stress of the present national emergency, with its intensified industrial production, about a third of the industrial cities in the United States experienced a jump in their tuberculosis mortality during the year 1941. Although the 1941 death-rate for upstate New York fell to a new low, the experience in many industrial centers of this area was not so favorable. The Syracuse death-rate from this cause rose from 33 during 1939, to 36 in 1940, and to 41 in 1941.

It is too early to predict how the war conditions during the next few years will affect the trends with regard to tuberculosis either in the State at large, or locally. The outlook is quite uncertain. There are a number of disturbing factors other than those already mentioned. In addition to the physicians and nurses who have already left Syracuse and Onondaga County for military service, many more will be taken away. The repercussions from this shortage of doctors and nurses both upon general health and upon the diagnosis and the treatment of tuberculosis in our city, are bound to be far-reaching. If nutritional or housing standards should be lowered as a result of the war conditions, the effects on health might prove most undesirable. Should any extensive epidemic of some other communicable disease arise in other countries - comparable, for example, with the great influenza epidemic of 1918 - and reach

the United States, the consequences could also conceivably be most serious.

Certain other factors, including the extensive X-raying of selective service men, bolster the hope, however, that we may at least hold the gains of recent years. In spite of the unanticipated present disturbed conditions, the attainment of the purposes of the tuberculosis eradication program may still be possible.

Even if tuberculosis death-rates in Syracuse and New York State should go up during the next few years, it is not unreasonable to believe that, in keeping with the experience during and immediately after the First World War, the rates would soon thereafter go down again. The long-range outlook is not discouraging.

Health is vital to national defense and victory. Because tuberculosis is so undermining of man-power and so wasteful, both our local community and the State have a responsibility for combating this insidious and devastating disease with unrelenting and redoubled energy. Because this fifth-column disease is eradicable, we should therefore hold fast to the goal of bringing about its elimination as speedily as possible.

Extent of the Syracuse Tuberculosis Problem

At the end of December, 1941, there were 553 persons among the population of Syracuse who were known to have tuberculosis in an "active" stage, that is, with its signs and symptoms still present. There were also 197 other Syracusans at the same time whose disease had become "inactive," which means a condition apparently arrested or improved, but which the physicians did not feel justified in pronouncing permanently recovered. This made a roster of 750 tuberculous individuals in the city who needed medical treatment or supervision.

Of those having active tuberculosis, 174 were in the Onondaga Sanatorium, and 50 were known to be in other sanatoria and hospitals. This left 303 other persons living in their homes and elsewhere, and 26 whose whereabouts were not definitely known.

These 750 men, women and children requiring supervision because of this disease were exclusive of an estimated 1,200 others whose disease was "apparently cured," and exclusive also of the many others whose disease has been healed long enough (at least five years) to be considered as "cured."

All newly discovered cases of tuberculosis are required by law to be confidentially reported by the physician to the Health Department, and the new cases so reported in 1941 numbered 206. This was 1 newly reported case every 31 hours. This compared with 167 reported in the year 1940, 183 in 1939, and 188 in 1938. Of these new cases found during the past year, 170 had tuberculosis of the lungs, and 36 of other parts of the body.

Listed in the roster of the Tuberculosis Bureau of the Health Department on December 31, 1941, were also, 2,361 known "contacts," that is, persons who had been exposed to the infection. This was exclusive of other possible contacts whose identity was unknown. Because of the health hazards created by their exposure to this infection, all contacts need to be medically examined. Of these 2,361 contacts, nearly two-thirds had been examined at some time or

other, and nearly half of them were examined during the past year. Many such persons require to be re-examined periodically.

Scattered throughout the city of Syracuse at the end of December were also unknown numbers of additional persons, chiefly men and women in the prime of life, who had significant tuberculosis which had not yet been diagnosed. Few of these people even suspected that they might have the disease. Such undetected spreaders of the tuberculosis germs are continually causing still more cases. If tuberculosis is to be stamped out in our city, these unidentified patients, and in turn their "contacts," must be found and examined. And in each successive year still more persons will have developed the disease and need to be searched for.

Nor does this grand total of some three or four thousand persons, just enumerated, constitute the full dimensions of the local tuberculosis problem. For in order to find the new cases as they develop from year to year, it is necessary, as will later be explained, to examine many thousands of additional persons, who, in spite of the fact that they are presumably well, may nevertheless have the disease.

Such are the wide ramifications of this formidable and serious medico-social challenge. And behind these statistics are the human elements, which cannot be measured. When these statistical items are individualized, they stand for disability and suffering, for loss of employment, the thwarting of ambition, poverty, homes broken up, lives needlessly snuffed out. Whether the "case" occupied a Sanatorium bed in Onondaga Hill, or is just around our corner, this is what tuberculosis means.

The Costs of Tuberculosis

The importance of putting an end to tuberculosis is further emphasized when we look at the financial side of the picture. For tuberculosis is notoriously the most expensive of all physical ills. The total burden imposed upon the public is far greater than most persons realize.

Studies in other places have shown that the average cost of a case of tuberculosis to the family, industry, and the community averages about $4,000. This was the amount arrived at, for example, in a very carefully conducted research of the costs involved in 100 cases of tuberculosis in a large industrial plant in Rochester.* This estimate covers both private and public costs, distributed as follows:

Costs to the families- - - - - - -	65 per cent
Costs to industry- - - - - - - - -	14 per cent
Costs to private agencies- - - - -	1 per cent
Costs to tax-supported agencies- -	20 per cent

First, there is the cost of Sanatorium care. The average maintenance cost of hospital care for patients in the Onondaga Sanatorium during the year 1941, exclusive of the cost of equipment, repairs, insurance and supplies on hand at the end of the year, was $3.17 per day. The gross cost

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* Paper by Sawyer & Richard, American Review of Tuberculosis, April, 1936.

per patient was $3.65 per day. On the first basis, the cost per patient discharged (average length of stay nine months) was $867, and on the second basis $1,000 per year. The average cost per year for the patients who remained in the Sanatorium throughout the entire twelve months was $1,165 and $1,332, respectively. When the further fact is taken into account that some of the patients remain for 10 years or more, a few for 20 years or more, it becomes easy to see how the expense of a single patient's Sanatorium care can run into large sums of money.

The aggregate expenditures of County funds for the Sanatorium during 1941 was $312,250. Of this amount, $247,450 was paid under the Sanatorium's initial appropriation in the 1941 County Budget, and $64,800 through the County contingent funds. After deducting collections and other credits, the net cost of running the institution was $297,939. Of this amount, roughly $239,215 was met by Syracuse taxpayers, and about $58,724 by taxpayers in the rest of the county. During 1942 the expenditures for needed repairs and new equipment will be less, but the cost of food and other items will be higher. The appropriation for the Sanatorium in the 1942 County Budget is $289,000.

The estimated expenditures of the City Health Department rendered necessary by tuberculosis during 1941, details of which are given in the table below, totalled, exclusive of any share of general administrative expenses, $29,795. The expenditures by the Health Service of the Board of Education in conjunction with its high school tuberculin testing program came to $1,086.

Because tuberculosis is so long lasting and incapacitating, it causes extensive dependency and the frequent breaking up of the home. This, in turn, entails expenditures for relief and social service which local taxpayers and private philanthropy must meet.

At the request of the Committee, the County Welfare Department has been good enough to review its expenditures for relief purposes rendered necessary during 1941 on account of tuberculosis among the residents of Syracuse. The reported expenditures include no relief items growing out of other causative factors among Syracuse families nor do they include any tuberculosis relief in families residing in towns in Onondaga County, about four-fifths of which must be paid for by Syracusans in their county taxes. Nor are any costs of social service included. The disbursements totalled $24,577. To this should be added $9,060 paid by the county for the care of Onondaga County patients in the Biggs Memorial State Hospital at Ithaca.

A similar inquiry among Syracuse families by the Veterans Relief Bureau, which is also financed through county tax funds, showed 1941 relief expenditures of $2,130.

The share of the State taxes assessed against the people of Syracuse for the support of the Division of Tuberculosis in the State Health Department, and for the general maintenance of the four State tuberculosis hospitals, aggregated $32,625. The foregoing local and state tax items during 1941 imposed upon Syracusans a burden of $338,488, a round third of a million dollars.

Certain federal taxes are also chargeable to this disease. For example, tuberculosis among our military and naval forces involved in the First World War had, up to December 1940, cost federal taxpayers for hospitalization, disability insurance, and pensions the staggering sum of $959,000,000. By the present time, the expenditures have likely approximated a billion dollars. Each army recruit in the present war who develops tuberculosis will, it is said,

eventually cost federal taxpayers an average of $7,500 to $10,000. The people of Syracuse must naturally meet their proportionate share of these and other federal costs attributable to this disease. The Committee has made no attempt to estimate the amount of these costs per year.

Various studies of the costs of tuberculosis to voluntary agencies, industry, and families, have been made in addition to the inquiry in Rochester. The Committee has had no means for undertaking a factual investigation of such private expenditures and losses caused by tuberculosis in Syracuse. However, on the basis of various known facts it is possible to venture certain estimates. In doing this, the Committee has endeavored to be duly conservative.

The expenditures through private channels for relief and social case work on the part of voluntary agencies, for the private care of children in institutions and foster homes, for bedside nursing by the Visiting Nurse Association, for the care of tuberculosis patients at private expense in general hospitals, for the X-raying of private hospital employees, and for the health education work of the Onondaga Health Association, unquestionably reach at least $25,000.

Industrial costs include wages paid during absence from work with adjustments for sick benefits, the costs of industrial health services, and other losses. These items in the Rochester survey, which was made during the depression, averaged $616 per tuberculous worker. The Committee assumes, for the sake of being conservative, that the comparable industrial losses in Syracuse were occurred in not over one-third of all known cases of active tuberculosis, say, in 175 cases, and that the losses averaged $250 per year. This would make an estimated industrial cost of $43,750.

The expenditures by families cover such items as private medical and nursing care, loss of wages, and miscellaneous other items. These losses in the 100 Rochester cases averaged approximately $1,100 per year. In making our estimate for Syracuse, the Committee assesses this type of cost at $500 per active case as of December 31, 1941. The resulting figure is $276,500.

Most of the victims of tuberculosis are in the prime of life right when their family responsibilities and their usefulness to the community are at a maximum. Just as the destruction of an automobile or a house means the loss of the net investment which it represents, so, too, the premature loss of a human life spells economic waste, (cost of rearing and living expenses up to the date of death, minus earnings). Each death during adulthood means the loss of net future earnings which might have been anticipated if the person had not died. Qualified statisticians have computed the net loss represented by deaths from tuberculosis, making due allowance for the average income levels and the ages of such persons, at about $15,000 per death. Reducing this to an estimated loss of $10,000 per death in Syracuse the resulting loss from the deaths of 83 Syracusans from tuberculosis during the past year would aggregate $830,000.

The foregoing known costs plus the estimated losses, chargeable against the people of Syracuse during the year 1941 because of this preventable disease, are summarized in the following table. They total $1,513,738. Were all the bills and losses appraised at their full amounts, the resulting economic burden would undoubtedly come much nearer the $2,000,000 mark.

Onondaga Sanatorium, net expenditures		$239,215
City Health Department:		
Tuberculosis Bureau	$10,545	
Nursing Bureau	7,784	
Laboratory	3,500	
City Hospital	4,035	
X-ray service at Dispensary	3,294	
High School case-finding surveys	637	29,795
Board of Education for high school case-finding		1,086
County Welfare Department for relief, exclusive of social service		24,577
County Welfare Department for maintenance of Onondaga County patients at Biggs State Hospital		9,060
Veterans Relief Bureau, relief		2,130
State Health Department, local share		32,625
Onondaga Health Association and other private agencies		25,000
Industrial losses		43,750
Family losses		276,500
Loss of economic values through 83 deaths		830,000
Estimated total		$1,513,738

As long as those having tuberculosis are allowed to continue spreading this infection to others, the people of Syracuse must continue to stand these needless losses. Nowhere is the old adage that prevention is cheaper than cure, truer than in the case of tuberculosis. Money spent for its eradication is a dividend-paying investment.

Tuberculosis In The Individual

Germ Origin. Tuberculosis is a communicable disease caused by germs known as tubercle bacilli. These microscopic germs multiply in the lungs of the persons who have the disease. The disease germs escape from the body through the sputum, and are spread to other persons through the careless disposal and scattering of it. Outside of the body these germs do not survive very long.

An examination by means of a microscope or certain other laboratory tests tells whether the sputum is "positive" or "negative." A report that the sputum is positive signifies that it contains living tuberculosis germs.

Infection. The tiny tuberculosis germs after being coughed up or otherwise given off by a tuberculous patient may be inhaled or swallowed by other persons with whom he is in intimate contact. When sufficient numbers of these living germs enter the body of another person, they set up a condition

known as tuberculous infection. This occurs mainly when the patient with the positive sputum has not been taught how to guard against scattering his tubercle bacilli, or when he does not follow the instructions. Persons are most likely to become infected when their contact with the spreader of the germs has been intimate and long-continued. The place where the infection is most commonly spread is in the patient's own household. Tuberculosis is not hereditary. The infection is, in each instance, contracted from some other person having positive sputum.

Whether any given individual has such an infection can easily be determined by a simple skin test. A droplet of fluid, known as tuberculin, is placed between the layers of the skin on the forearm. If the infection is present, this fact will be shown in 48 hours by the skin reaction at the point where the tuberculin was placed. Should the reaction prove to be "positive," it indicates that the person is infected.

Because the chances of being exposed to this infection increase as people grow older, the percentage of the population who react positively to the tuberculin test naturally increases with age. The proportion of those infected also varies in different social, economic, and occupational groups. In some groups and neighborhoods not more than a tenth or a quarter of the people have picked up the infection, while elsewhere nine-tenths have become infected.

The infection may last for years, even for a lifetime, but only a small percentage develop active disease.

Pulmonary Tuberculosis and Its Stages. When tuberculosis develops as a disease, it is usually located in the lungs, and is then known as pulmonary tuberculosis. Unless otherwise stated, the term "tuberculosis" as used in this Report means pulmonary tuberculosis. For reasons that do not need to be elaborated, the local warfare against tuberculosis must be directed almost entirely against its pulmonary form.

The transition from infection to active disease takes place when the invisible germs which reach the lungs at the time of infection, multiply to such an extent as to prove damaging to the lung tissues. This development into an active disease condition may occur shortly after the infection begins, or in other persons not until after more massive re-infection months or years later. The disease processes are most likely to assume serious significance when the person's resistance has been lowered through malnutrition, fatigue, or other unfavorable conditions.

Pulmonary tuberculosis may go no further than its first stage, or it may go through two or three successive stages. These are:

(a) An early or minimal stage, usually lasting a year and a half, or longer, before any cavity is formed in the lungs. The person with early tuberculosis ordinarily has no symptoms and may look entirely well.

(b) A moderately-advanced stage in which a small lung cavity has developed. During this stage the patient may or may not begin to feel ill. If there are any symptoms they are usually a slight feeling of fatigue and perhaps a loss of weight, slight fever, or cough. Only rarely at this stage is there any pain in the chest.

(c) A far-advanced stage in which the cavity has become larger, or additional cavities have formed. By this time the symptoms tend to increase, but even in this stage the patient may not realize that he has tuberculosis.

The outcome of pulmonary tuberculosis follows any one of four alternative courses:

(a) The disease may become quiescent or apparently arrested, perhaps remaining in such a condition for years or even for life. As long as such a chronic condition lasts, it usually necessitates special precautions, including restrictions of activity.

(b) After months or even years of inactivity or apparent arrest, the disease may suddenly become active again. Sputum that was negative may at this time become positive. It is because of this instability and the unpredictable character of the disease that tuberculosis is so treacherous, and that those having it need such close and prolonged medical oversight.

(c) It may become cured, either spontaneously or through treatment.

(d) It may grow progressively worse until its poisonous and destructive effects cause death.

Public Health Aspects of Tuberculosis

It is primarily because of its communicable nature that tuberculosis is of such great public health concern. It calls not only for the medical treatment of the individual who is ill, but also for the prevention of the spread of the infection to other persons.

This is why the people of the State of New York and the people of Syracuse have organized the extensive existing facilities, both governmental and private, which aim at controlling this disease and at preventing its spread. It has been for similar reasons that the Public Health Law places certain legal responsibilities regarding the control of tuberculosis upon public health officials, and that it expects the performance of certain duties also by private physicians and by those who have the disease.

With regard to no disease can it be more truthfully said that the problem is one in which the medical profession, public health agencies, the patient, and the entire public have joint interests and responsibilities. Tuberculosis cannot be cut down either by governmental agencies alone, or by private physicians alone; the public program requires the cooperation of private practitioners, and the latter need the help that comes through official channels. The attitude of the American Medical Association, the Medical Society of the State of New York, and the medical profession of Onondaga County with respect to the control and ultimate conquest of tuberculosis, is forward-looking.

An infection which is so easily scattered and persists for such long periods has no geographical boundaries. Hence the elimination of tuberculosis

from Syracuse depends in part upon the quality of the health and tuberculosis program in other parts of Onondaga County, and throughout the State and the United States. Local, state and national activities must be integrated.

And finally, as with all public health undertakings, thoroughly approved methods must be used, and the entire program must be properly implemented.

Conclusions and Recommendations

1 - Tuberculosis is a serious, widespread and costly community problem. The disease is preventable and wholly unnecessary. The sooner it is abolished, the greater will be the prevention of misery and deaths, the greater will be the efficiency of our people, and the greater will be the resulting economic savings.

2 - The State program launched during the spring of 1941 for the early eradication of tuberculosis - if possibly by the year 1960 - is sound and practical. The probable effects of the war upon such a plan to wipe out tuberculosis from Syracuse and the rest of New York State within one generation, are hard to predict. Syracuse has had an outstanding record in combating tuberculosis. The means by which the disease can be controlled and wiped out are definite and well understood.

3 - The people of Syracuse and New York State should do everything in their power to get rid of this dangerous and needless disease at the earliest possible date. What is now called for is an intensified attack against it on all local fronts, and a better organization of official and non-official efforts to eradicate it. Expenditures of money for this purpose now will prove a wise and economic investment.

PART II. - CASE-FINDING

Importance of Discovering All Cases of Tuberculosis

The task of eradicating tuberculosis from Syracuse calls for attack along six fronts. These are:

Case-finding
Case-control
Treatment
After-care and rehabilitation
Health education of the lay public
Preventive measures

The point where the Syracuse program most needs to be strengthened is in finding the cases. The most important single job to be done is to discover the identity, whereabouts, and stage of disease, of each and every person having this infectious disease, wherever they may be, and whatever walk of life they may follow. This is no easy task. For tuberculosis is an insidious, fifth-column enemy which works its havoc under cover, and gains its foothold without warning. What is called for is, therefore, a kind of medical detective work. To use more technical language, it demands skilled epidemiological work.

Experience has shown that the case-finding efforts should be concentrated as largely as possible upon the discovering of the disease in its pulmonary form. Tuberculosis of the lungs is not only its most prevalent form and the most serious in its consequences, being responsible for about 98 per cent of all tuberculosis mortality; the pulmonary form of the disease is also the most infectious and is of the greatest strategic importance from a public health point of view.

The search for the unknown cases should aim at their discovery, regardless of the stage of the disease, and regardless of whether it is infectious or non-infectious at the time of its discovery. It is of special importance, of course, to learn of all persons who have the disease in an active or infectious stage, for it is then that it is most dangerous. However, it must be remembered that those whose disease is at the moment incipient or inactive, may in many cases grow worse rapidly, and that those with negative sputum may, without warning, develop positive sputum and become a source of danger to others. Hence all stages must be sought after.

The earlier the disease can be discovered, the more successfully it can be treated. The less likely it is, also, to be infectious. Hence the great emphasis upon early diagnosis.

The most practicable and dependable means of detecting pulmonary tuberculosis during its early or minimal stage, as will later be more fully explained, is through the X-ray examination of the chest. A physical examination, no matter how great the physician's skill, cannot determine whether a person has a minimal stage of tuberculosis, unless the X-ray is employed. The important part played by the tuberculin skin test as a case-finding means will also be discussed later.

Persons Most Needing To Be Examined

Experience has taught many lessons with regard to the best avenues for uncovering hitherto undiscovered cases of tuberculosis. During the early days of tuberculosis work in Syracuse, attention was especially focused upon the examining of persons who had begun to show a cough, loss of weight, or any of the other well known signs of "consumption," as the disease was then called. Persons with any such suspicious signs of tuberculous trouble still constitute one of the most productive fields for case-finding.

The greatest changes in the approach to tuberculosis case-finding in recent years have been, first, the turning of attention more and more toward the discovery of the disease before any smptoms are felt. This requires the searching for the disease among persons who, on the basis of their outward appearance, seem to be healthy. The necessity of looking for the disease among apparently well persons is indicated by the fact that the ravages caused by pulmonary tuberculosis often go on for fully a year and a half before manifesting any outward signs.

The second big change in emphasis, taught by experience, has been in paying more attention to looking for tuberculosis among so-called "contacts." A contact, as has been stated, is a person known to have been living with, or otherwise associated with, someone having the disease. Tuberculosis is characteristically a household infection. Next to those who go to a doctor or clinic for an examination because they feel that something may be wrong with them, the most fruitful group for case-finding efforts are these contacts.

A third and more recent change in endeavoring to discover new cases has been to concentrate the case-finding efforts not upon young children as used to be done, but upon adolescents and grown-ups. It is characteristically a disease of adults.

Because one can never anticipate just which individuals have the disease, the case-finding effort in Syracuse must be widespread and extensive. It must embrace the examination, in the aggregate, not of hundreds, but of thousands of Syracusans each year. It would be utopian to contemplate the examination of the entire population. There is no suggestion that anything of this sort be attempted. The practical approach is to seek the hitherto undiscovered cases chiefly among those groups where the disease is most likely to be found.

Experience has shown that outside of those who go to a physician or clinic of their own accord, the kinds of people among whom the findings are likely to prove the largest and the unit costs can be kept relatively low, are the following:

1 - Persons having any signs or symptoms suggestive of tuberculosis.

2 - Contacts, - that is, persons who have been exposed to an active (usually infectious) case of tuberculosis, whether in their own household or elsewhere.

3 - With regard to age the persons whom it is most important to examine are the older adolescents, and adults, especially the latter. Among females the ages most important to cover are from 18 to 35 years. Among males the corresponding period of greatest prevalence of the disease begins at about 18 years, but

extends to 45 years. Older persons may also require examination. For example, tuberculosis often occurs among men who are 60 years old and over.

4 - Persons on relief and in other low-income groups. Ward patients in hospitals should be included here, both because of their economic status, and because they have something wrong with them physically.

5 - Industrial workers. Positive findings are most likely to be found among unskilled workers, those with low income, and those exposed to harmful dusts.

6 - Colored persons. Among such persons the disease starts earlier than among whites, progresses more rapidly, and has a higher fatality rate.

7 - Nurses, medical students, and others who may be exposed to possible infection through intimate contacts with the sick.

8 - Women who are, or have recently been, pregnant.

9 - Persons who have had their resistance lowered through being diabetic, or through having recently had influenza, pneumonia, or some other severe respiratory or debilitating disease.

10 - Institutional inmates, including those in mental institutions, the Penitentiary, and the County Home. Also homeless men and other persons in low-priced lodging houses.

11 - Household workers, school teachers, foster mothers, and others having intimate contact with children.

12 - Other adults. Periodic health examinations by a physician are desirable for everybody.

13 - University students, upper class students in high schools, and certain groups of out-of-school adolescents.

It will be noted that no reference is here made to any attempts at wholesale case-finding among young children. The problem of tuberculosis in children will be touched upon later.

Case-Finding by Private Physicians

Private physicians have the best opportunities to discover new cases. This is because they see in the aggregate such large numbers of patients, many of whom may have tuberculosis without knowing it. The extent of their participation in the local tuberculosis program is indicated by the fact that 104 out of 265 admissions into the Onondaga Sanatorium in the year 1941 were on application from private doctors. Physicians during this same period also referred 485 out of the 1,337 new cases handled by the Chest Clinic.

Syracuse physicians now give more attention than ever before to the possible existence of tuberculosis among their patients. They quite generally

include a tuberculin test, and if necessary a chest X-ray, as part of their routine examinations. They are increasingly sending private patients of limited income to the Chest Clinic whenever it seems desirable to have a chest X-ray for which the patients cannot pay. Physicians are also consulting with the medical staff of this Clinic concerning the diagnosis and treatment of patients, much oftener than formerly.

As more doctors follow these practices, greater numbers of tuberculosis cases should be discovered before their disease reaches an advanced stage. At the present time in fully three-fourths of all reported cases, the disease has already become advanced when first diagnosed. The most hopeful way of correcting this situation will be by having people seek medical advice earlier. At the same time every practitioner of medicine must be on the alert for the detection of possible tuberculosis signs.

In these days when the treatment of tuberculosis has to such a great extent been taken out of the hands of private practitioners and absorbed by public agencies, there is particular need of having physicians acquainted with the latest medical discoveries and thought in this field. The Committee on Public Health and Education of the Medical Society of the State of New York conducts a valuable program of post-graduate education on various subjects, including tuberculosis, throughout the State. The instruction offered is both didactic and clinical, and in the tuberculosis courses the State Department of Health cooperates with the Medical Society of the State. In view of the State-wide campaign for the elimination of tuberculosis, and also because so many physicians experienced in tuberculosis work are now being called away from their own communities on account of the war, it is increasingly important that courses dealing with this subject be conducted in all parts of the State, including Syracuse.

The Medical College of Syracuse University has in recent years given increased attention to the instruction of its students in the diagnosis, treatment, and public health aspects of tuberculosis. Both the Chest Clinic and the Sanatorium cooperate in furnishing opportunities for clinic observation of patients.

Case-Finding by the Chest Clinic

The principal official agency in Syracuse engaging in case-finding efforts is the Tuberculosis Bureau of the City Health Department. This Bureau is responsible for the control and prevention of tuberculosis throughout the city of Syracuse.

The Tuberculosis Bureau conducts a Chest Clinic at the rear of the Syracuse Free Dispensary building, located at 610 East Fayette street. Established in 1908, this clinic was the first one of its kind in upstate New York.

Under the part-time medical director of the Tuberculosis Bureau there were until recently four part-time examining physicians. The calling of local physicians for war duties has seriously crippled its Clinic staff. The tuberculosis supervising nurse, who works under the joint supervision of the Tuberculosis Bureau and of the Nursing Bureau of the Health Department, attends all clinic sessions, and exercises general supervision over the Department's public health nurses in so far as their duties pertain to tuberculosis cases. The Bureau also has two full-time clerical workers.

The Clinic is in session for the examination of adults from 3:00 to 4:30 o'clock on Monday, Wednesday, and Friday afternoons and also from 7:30 to 9:00 o'clock each Wednesday evening. Each Saturday morning a session is held for children. It gives an initial medical examination to all patients residing in Syracuse, regardless of ability to pay or of the source of their referral. (The Sanatorium, in turn, restricts the examination of patients by its clinics to persons who live in Onondaga County outside of Syracuse.) Patients are also re-examined as often as their condition necessitates.

The Clinic provides medical treatment, including pneumothorax, for ambulatory patients living in their own homes. It also arranges for the admission of patients to the Sanatorium. During the year 1941 the Clinic held 248 clinic sessions, and examined 2,683 patients who made a total of 7,010 clinic visits, an average of 28.2 visits per session. The chest X-ray examinations numbered 3,272, the tuberculin tests 1,260, and sputum examinations 1,141.

Clinic Quarters

The present quarters occupied by the Chest Clinic in the Dispensary building are too small, poorly arranged, and far from cheerful. The limited space assigned to the Tuberculosis Clinic is divided into five different compartments. The waiting room lacks facilities for segregation of patients. The two examination rooms, the cubicle used for pneumothorax treatments, and the record room, also leave much to be desired.

X-ray examinations are made in an adjoining room in the Dispensary.

The Clinic and its X-ray facilities should be housed in quarters which are more commodious, better laid out, and more conducive to promoting clinic attendance. There are definite advantages in having the Chest Clinic located in the same building that is used by the Dispensary for its other types of clinics. Because of the well recognized shortcomings of the building occupied by the Dispensary and the Chest Clinic, a plan is being discussed for the possible erection, as soon as the needed funds can be secured, of a new building in the Medical Center, where both the Dispensary Clinic and the Chest Clinic can be housed.

Role of the Public Health Nurse in Case-Finding

In the attack against tuberculosis the work carried on by public health nurses is of key importance. The Nursing Bureau of the City Health Department has a staff of 35 nurses, of whom 30 do field work on a district basis. In addition to being registered nurses, they have had special graduate courses in public health nursing.

The members of the Nursing Bureau staff do generalized nursing, which means that each nurse works in five major fields: tuberculosis, child hygiene, maternal hygiene, school nursing in parochial schools, and communicable disease. Their tuberculosis work consumes about 20 per cent of their time in the field, and 25 per cent of their time in clinics. In dealing with tuberculosis cases they serve under the general supervision of a special tuberculosis supervising nurse.

While various responsibilities devolve upon these nurses in connection

with tuberculosis, none is more important than that of inducing contacts and also other persons to have the necessary medical examinations for the possible detection of tuberculosis. This is largely an educational task. It calls for the exercise of great tact, resourcefulness, and persuasive abilities. When those persons particularly in need of being examined persistently neglect or refuse, as they so often do, to go to a physician or a clinic, it becomes more important than ever that the nurses visit them in their homes for the purpose of enlisting their cooperation. Men and women working in industry can often be seen only on Saturday afternoons or in the evening.

During the year 1941, the Health Department public health nurses induced 395 persons to be examined for tuberculosis.

The success of whatever mass case-finding surveys that may hereafter be undertaken in Syracuse will depend, in no small measure, upon the local public health nurses. It is these nurses who must do much of the yeoman service in the organizing of the projects, in the scheduling of the appointments for the examinations, in reporting the findings, and in inducing those covered by the surveys to have the needed follow-up examinations.

In addition to the 35 public health nurses employed in the Health Department, the public schools have their own staff of 18 school nurses, and the Visiting Nurse Association has a staff of 21 nurses specializing in bedside nursing of the sick. The trends in nursing work in American cities are in the direction of greater coordination and generalization of services. All these nurses, as well as industrial nurses, have essential parts to play in the community case-finding effort.

Four Approaches to Case-Finding

The motivating of persons to be examined may be approached in four different ways. The act of inducing them to have such an examination may be initiated by the persons of their own accord, or may be brought about upon the recommendation of the physician or the health agency. The eradication of tuberculosis in Syracuse demands use of all four of these approaches. The approaches and the grounds on which they are based are the following:

(a) Examination of symptomatic cases. The person has apparent or possible symptoms of tuberculosis.

(b) Examination of contacts. The person has been in contact with tuberculosis.

(c) Mass surveys. The person belongs to a group whose members, taken by and large, are more likely than most persons to develop the disease.

(d) General health examinations. The person has no apparent symptoms or no history of contact, but for one or another reason recognized the wisdom of going to his physician for an examination.

(a) Examination of Persons with Apparent Symptoms: The examination of those who present possible evidence of tuberculosis - fatigue, loss of weight, chest pain, cough, spitting of blood, night sweats, indigestion, and the like - gives a high yield in the discovery of cases.

Out of 716 persons, with one or more such signs, however slight they might be, but with no known contact history, examined in the year 1940, the findings were that 29 had active pulmonary tuberculosis, and 19 others had the disease in an inactive stage - a total of 48 cases. This is a yield of 6.7 per cent, of which 4 per cent were active, and 2.7 per cent inactive.

When persons wait to be examined until they have symptoms of pulmonary tuberculosis, the disease, if found, is usually in an advanced stage. Only seldom in these symptomatic cases is it in a minimal stage, when it is easiest to cure, and least likely to be infectious.

(b) Examination of Contacts: The minimal stage of tuberculosis is found chiefly when the examinations are made before any symptoms have appeared. This is one reason why the examination of contacts is so important.

During the year 1940 when 377 known contacts were examined, 21 tuberculosis cases were found, a yield of 5.6 per cent. Of these, 15, or 4 per cent, were active, and 6, or 1.6 per cent, were inactive.

The table below gives a more detailed analysis of the result of the contact examinations made in 1941. The combined numbers of such persons reported as made by physicians and at the Chest Clinic was 1,089. Fifty-two cases were discovered, making a yield of 4.8 per cent. The active cases numbered 37, or 3.4 per cent, and the inactive cases, 15, or 1.4 per cent.

Ages	Known contacts	Contacts examined in 1941	Diagnosed in 1941 Active	Inactive	Percentage Active	Inactive
All ages	2,361	1,089	37	15	3.4	1,4
Under 15 years	529	379	4	2	1,1	0,5
15 - 24 years	525	303	15	2	4,9	0,7
25 - 44 years	617	264	13	8	5.0	3,3
45 and over	690	143	5	3	3.5	2.1

Special attention is invited to the distribution of the foregoing contacts by age, and to the yields for the different age groups. The figures clearly demonstrate that the contacts most needing to be examined are the adults. While 1.6 per cent of those under 15 years of age were diagnosed as tuberculous, those in the older age brackets, so diagnosed, ranged from 5 to 8 per cent.

Unfortunately, however, - and in spite of a special effort to induce the adults to be examined - the older the contacts are, the harder it is to persuade them to have the needed examination. The percentages by age of those appearing for the examinations in 1941 were as follows:

Age of contacts	Percentage examined
Under 15 years	71
15 - 24 years	57
25 - 44 years	43
45 and older	21

It is a challenging fact that 894 of 2,361 contacts, or 38 per cent, included in the roster of the Tuberculosis Bureau on December 31, 1941, had up to that time, in so far as the facts were ascertainable, never been examined at all. The probable positive findings, were these persons to be examined, would tend to be greater among those contacts who have recently associated with active (infectious or potentially infectious) cases of the disease, than among those in contact with inactive cases. Taking these 894 patients as a whole and without regard to this distinction, and applying the percentages for the different age groups actually found to be tuberculous in 1941 to these 894 contacts who had never been examined, as many as 50 additional cases of tuberculosis might possibly be found. Of these, about 33 might perhaps have the disease in an active stage. Such facts as these further emphasize the importance of securing the largest possible coverage of contacts, particularly of the adult contacts.

The State Health Department recently studied the factors leading to the discovery of tuberculosis among 110 Syracusans during the past year. The findings, not yet published, show that three-tenths of the persons had been household contacts, two-tenths had their exposure away from home, and in five-tenths of the cases the source of exposure could not be learned.

(c) Mass Surveys: In addition to such persons as go to a physician for examination of their own accord because of symptoms of illness, and in addition to the contacts and other persons who can be induced to be examined, there are various groups of persons in the city who can best be reached through mass surveys. In place of expecting them to go to the doctor and the X-ray machine, under mass survey methods the doctor and the X-ray machine go to them.

An example of this approach has been the annual tuberculosis case-finding surveys in local high schools which are done in the school buildings.

During the last half dozen years the use of mass survey methods in different places in the United States has greatly increased. Among large sections of the population in Syracuse this approach offers the only practicable means of inducing the people to receive the needed examinations.

(d) Periodic Health Examinations of Apparently Well Persons: Periodic health examinations of presumably well persons for the dual purposes of detecting previously unrecognized disease conditions, and of providing such persons with needed health guidance, began to receive nation-wide attention about 20 years ago. Syracuse physicians and health agencies took steps about that same time to encourage this practice locally.

The examination of apparently healthy persons, and also mass surveys, as well as contact examinations, have the advantage of detecting the disease in an earlier stage than is usually possible when there are no examinations until symptoms have appeared.

Although it has been quite difficult to "sell" the idea of periodic

health examinations of adults, increasing numbers of Syracusans have in recent years adopted the practice of going to their physician at regular intervals for this kind of a health inventory. These health examinations should include a chest X-ray.

X-ray Methods and Equipment

The strategic role of the X-ray picture in the diagnosis of tuberculosis, and the relatively smaller part played by the listening to chest sounds, has led to the frequent remark that for diagnostic purposes tuberculosis must be seen, not heard. Therefore, one of the major essentials in fighting tuberculosis must be the provision in the community of X-ray facilities which are adequate for the tasks ahead.

X-ray Services by Private Physicians: The persons to be covered by the community-wide program for making the needed chest X-ray examinations may be divided into three classes with respect to economic status and willingness to be X-rayed.

> Those who can afford to pay a private X-ray specialist or other physician his regular charge for the needed X-ray service, and who are willing to do so.
>
> Those who can and will pay a private X-ray specialist or other physician only a moderate fee in keeping with their financial status.
>
> Those who will be X-rayed only when the X-ray examination is done free of charge.

In Syracuse there are nine roentgenologists or radiologists (physicians specializing in X-ray work). Eight of these physicians use their own X-ray equipment. Several internists also possess their own X-ray machine for use in their private practice. Each general hospital in the city also has its own X-ray equipment. The machines commonly used by private physicians and in hospitals, take chest X-rays on a standard 14 by 17 inch celluloid film.

The public, as a rule, has little appreciation of the costliness of X-ray equipment and of the reasons why radiologists charge the fees they do. The initial investment in a modern type of X-ray machine using these standard-sized celluloid films runs from about $2,000 to $15,000. The tube alone may cost from a few hundred dollars to as much as $3,000, and it can be used for only a limited number of hours. These costs, as well as rent and other overhead and various other items, are naturally taken into account in determining the charges.

The usual fee for taking a single chest X-ray is beyond the pocketbook of a large proportion of the population, particularly of those among whom tuberculosis is most prevalent. Where several members of the family need X-raying, the aggregate cost runs into prohibitive figures.

In the interest of aiding the fight against tuberculosis the X-ray specialists of Syracuse have recently adopted a scale of reduced charges for persons who cannot pay the regular fee. They have agreed in such cases to take the roentgenograms, develop them, and interpret them for $3 to $5, according to the financial circumstances of the individual.

X-Ray Equipment Owned By Public Agencies: One of the biggest problems in connection with a community-wide X-raying program concerns the most practical method of providing X-ray service, in connection with tuberculosis case-finding, for those persons who are unable to pay. The responsibility for this service rests upon the City Health Department.

The Health Department Chest Clinic has its own stereoscopic X-ray machine. It is a stationary type of machine taking 14 by 17 inch pictures. It is employed, however, not only for the taking of chest pictures, but also for general X-ray work in the other clinics at the Dispensary. Originally purchased in 1925 at a cost of about $4,000, which sum was provided jointly by the city and by the Milbank Memorial Fund, the apparatus has recently been partly modernized. It now has a capacity of 200 milliamperes. The Health Department also owns a 35 milliampere mobile apparatus, using standard celluloid films, which is housed in the City Communicable Disease Hospital. During the high school surveys it has been taken on a truck to the schools where the X-ray work is done.

The Onondaga Sanatorium has a stationary apparatus with a shockproof 200 milliampere tube, which is in daily demand for studying the Sanatorium patients. During the past year the Sanatorium also purchased a portable 15 milliampere apparatus for use in its rural clinics.

Comparison of Different Types of Equipment and Films: In carrying out the greatly expanded program of X-ray case-finding which this Report recommends, five prime requirements must be met.

> Private physicians should play an increasing role in taking chest X-ray pictures of patients who can afford to pay either regular or reduced fees.
>
> The Chest Clinic should continue to take chest X-rays of its individual clinic patients.
>
> The Tuberculosis Bureau must possess the necessary additional equipment which will make it possible to take chest X-rays of large numbers of persons, literally hundreds at a single session, in rapid succession, say, at the rate of 100 per hour. It must be possible to carry on this kind of mass survey work in whatever locations are most accessible for the persons needing to be X-rayed. This requires that the equipment must be capable of transportation from one section of the city to another. At the present time there is no such apparatus in Syracuse.
>
> The cost of conducting the needed mass surveys, including the unit cost per film, must be low and should be met from public funds.
>
> And finally, the X-ray techniques and the medical interpretation of the films must be on a high level of efficiency.

In X-ray work the kind of equipment needed depends on the purpose for which the pictures are taken. (1) In making a painstaking diagnostic study of an individual patient, the picture must reveal the chest conditions with the highest possible degree of accuracy. In this kind of radiology of the chest, the speed and cheapness of taking the pictures are secondary considerations.

(2) Where large numbers of persons are to be surveyed at a time, the elements of speed and cheapness become important considerations. The purposes of a mass survey are sufficiently served if the quality of the pictures is reliable enough to screen out those persons who should later receive an X-ray study by more refined methods. This requirement is met when the films used for the preliminary screening purpose are capable of demonstrating the existence of pulmonary tuberculosis in its early or minimal stage.

There are five alternative methods of making chest X-ray examinations. Certain of these methods are better adapted than the others for mass or screening survey purposes.

(a) From the point of view of maximum clearness and accuracy, the use of the 14 by 17 inch celluloid film, taken by a powerful stationary machine, is universally conceded to be the ideal method. The disadvantages of using this type of equipment for the screening purposes are that it is cumbersome and cannot be moved about the city from place to place, that it operates slowly, and that it is the most expensive of all methods.

(b) Another method of examining individual patients is by means of the fluoroscope, which permits the physician to view an image of the patient's chest in a darkened room. This method leaves no permanent record and misses many cases. It, too, is not practicable for mass survey purposes.

There remain three alternative methods of conducting mass X-ray surveys for screening purposes, as follows:

(c) Emulsified paper films, usually 14 by 17 inches in size, have been in use for several years. The pictures can be taken at the rate of approximately 100 persons per hour. This method can be used only under contract with the private company, which manufactures the equipment and sends its own technician to operate the machine.

(d) Another method of rapid taking of chest X-rays is through the use of a micro- or miniature 35 millimeter celluloid photograph of the image cast by the X-ray upon a fluorescent screen, behind which the patient stands. The resulting photofluorogram, or miniature picture, is later enlarged for interpretation by the physician.

(e) Another type of apparatus uses this same general method, but produces a 4 by 5 inch celluloid film, which can be viewed and interpreted without enlargement.

All three of the last named kinds of apparatus are now available in forms that take stereoscopic pictures.

Authorities in the fields of radiology and of the diagnosis of tuberculosis differ in their judgment as to the relative merits of the last named three methods of conducting mass surveys. The results of comparative studies made by competent investigators indicate that all three methods - the 4 by 5 miniature films, the 35 mm. films, and the paper films - have their merits. They are also widely used.

Chief Local X-Ray Need: The most important single recommendation which the Syracuse Conference Committee on Tuberculosis makes in this Report is that

the Tuberculosis Bureau of the City Health Department should be enabled to make use of one of these rapid-action types of equipment for conducting mass X-ray surveys.

Provision should be made by the City for the purchase of an approved type of X-ray machine at a cost of approximately $6,000. Provision should at the same time be made for equipping it with a camera capable of taking rapid stereoscopic films (two at a time, each taken from a slightly different angle). This, according to the type of apparatus available, would call for an additional expenditure of $350 to $4,000, making a total capital investment of $6,350 to $10,000.

There should also be made available, $400 additional for accessories and miscellaneous items.

The annual cost of operation would depend upon the extent to which the equipment would be used. A fair estimate of the number of persons to be X-rayed through the mass surveys for which the machine is mainly intended, would be in the neighborhood of 5,000 per year. The cost of the films (two stereoscopic films per person), of processing them, and of other needed materials and records would be about twenty cents per person, or $1,000 per year.

There should also be an item for transportation totalling $200.

The Tuberculosis Bureau would require certain additional personnel - one full-time physician at $5,000, and one full-time technician at $1,800.

In view of the huge costs of tuberculosis to the community, these expenditures would be a wise investment. The result should be a tapering off in the number of tuberculosis cases in the community until a point should be reached, within the not too far distant future, when tuberculosis would cease to be a formidable public health problem.

The Tuberculin Test

Great importance also attaches to the tuberculin skin test in connection with case-finding. This test offers the most sensitive and practical means of discovering those persons who are infected. If the reaction is positive, it means that the person tested has been in contact with an infectious case of tuberculosis. It indicates the need of further medical study, including a chest X-ray, to determine whether the infection has developed to a stage where pulmonary or other active tuberculosis exists.

The customary procedure in examining persons where the probable incidence of pulmonary tuberculosis is low, is to perform the tuberculin test first. This makes it unnecessary to X-ray those who react negatively.

Among older persons and especially in those groups where over half of the persons are presumably infected, it is more practicable to begin with the X-raying. The number of those needing to be tuberculin tested is in this way greatly reduced. This procedure also cuts down the number of visits either by the patients to the doctor, or by the doctor to those to be examined.

Case-Finding in Industry and Business

The least developed field for finding new cases of tuberculosis is in

industry and the business field. Industrial establishments afford an exceptional opportunity for tuberculosis screening surveys because of the fact that so many hundreds or thousands of adults are so conveniently available for examination.

Surveys in many communities have shown that about 1 per cent of the industrial workers examined have tuberculosis. If the effort to eradicate this disease from Syracuse is going to be successful, it must include this big sector of our population.

Under normal conditions, the prevalence of tuberculosis among industrial workers varies with the occupation and with the population groups from which they are recruited. The disease does not, as a rule, result from conditions within the industry itself. It is generally brought in from the homes and the outside community where the workers generally spend about two-thirds of their time.

Unskilled workers generally have more tuberculosis than do skilled workers. The latter, in turn, have more of it than do executives and professional workers. If the employees of a given plant come from a cross-section of the population where the standards of living are low, there will tend to be a greater amount of tuberculosis among its employees, than will be found in another establishment where the workers come from homes of a higher income level. Women workers under 35 years of age, and men under 45 years, represent the age periods when new cases of tuberculosis most frequently develop. The older the industrial workers, the more likely is the existing tuberculosis to be in an advanced stage, during which it is most infectious. The congregating of large numbers of persons under one roof makes it that much easier for those with positive sputum to disseminate their germs to fellow workers.

Under wartime conditions, the enormous increases in local industrial activity threaten to result in increased tuberculosis. This is the usual experience in warring countries, and such increases in the incidence of the disease as have recently occurred in New York State have for the most part been in industrial centers. The stress and strain of the longer and irregular hours of work, and the greater crowding with regard to housing conditions and in shops and mills, tend to contribute both to the increased spread of the infection and to more frequent breakdowns from this disease.

Syracuse has in recent years had an average of about 18,000 persons on the payrolls of its local industries. As a result of the recent expansion of defense production, the number of workers in the Syracuse industrial area is reported to have increased at the end of 1941 to nearly 40,000 and before the end of the year 1942 the number may rise to nearly 50,000. Not a few of this added army of workers are moving here from other localities, where the incidence of tuberculous disease is higher than in our local area. A further threat lies in the fact that the new employees will include large numbers of women of the very ages at which pulmonary disease most frequently develops.

In spite of the fact that today industry has far fewer deaths, less absenteeism, and less labor turnover due to tuberculosis than in past years, the disease, when it does hit an employe, keeps him away from work as long as ever, and the costs to industry and the city are as great as ever. No Syracuse industry wants an employee to spread a dangerous communicable disease like tuberculosis among its other workers. Nor is it good business for industry to be obliged to shoulder the tax burdens imposed by this needless disease.

Factories, mills and other work places afford several means of tuber-

culosis case-finding among adults.

(a) Pre-employment medical examinations are being increasingly required by local industries. In a recent survey of 21 plants in the local industrial area employing over 500 workers each, all but 2 had pre-employment examinations. Yet, only 2 of these industries thus far own their own X-ray machines, and only 2 have their own fluoroscopes. A history of past tuberculosis on the part of an applicant for work should not necessarily prevent his or her employment. Those with a former tuberculous condition which has become thoroughly arrested and stabilized, are fully capable of working again, provided the work is of a suitable character. On the other hand, the employment of anyone with an active, unarrested, or unstabilized pulmonary condition would be most unwise and dangerous.

(b) Opportunities for finding tuberculosis also exist in connection with the routine services provided by industrial physicians and industrial nurses, who look after the miscellaneous medical cases as they arise from day to day. Such conditions as a chronic cough, chest pain, or persistent fatigue may prove highly significant. A re-activated tuberculous condition may also be discovered at times through a medical checking of employees who have been absent because of illness, particularly pleurisy, influenza, or pneumonia.

(c) The mass survey method offers the third and most promising means of uncovering the tuberculosis cases which exist among Syracuse industrial workers. Many industrial workers will not go to a doctor or clinic to be X-rayed; the X-ray machine and the doctor must go to them. In order not to interfere with industrial production, the X-ray equipment must be of a modern, fast-acting type. If Syracuse is to cut down its tuberculosis, a city-wide program of tuberculosis case-finding in industry, including mass surveys, is a major necessity.

The City Health Department is the logical agency to organize and conduct these mass surveys in plants where there are no other provisions for doing the work. Such a program will naturally require the understanding and backing of both employers and employees. Before launching such a community-wide program, it should be submitted to the Syracuse Academy of Medicine, and be discussed also with the local industrial physicians. The findings in such examinations should be treated as confidential, and the films would become the property of the Health Department. Such an undertaking if carried on during the next few years would unquestionably prove of great benefit to the workers, to the companies employing them, and to the community.

National Youth Administration and Industrial Defense Trainees

The National Youth Administration made it a requirement, beginning in May, 1939, that all youths on its rolls must receive a tuberculin test, and, if necessary, an X-ray examination as well. Up to July 1, 1941, about 2,000 out-of-school young persons from the ages of 18 to 24, so employed, were given these examinations by the Tuberculosis Bureau of the City Health Department. On the last named date, the NYA. set up its own medical service, as part of a nation-wide NYA. program. Since that time federal moneys have paid for these services. Two medical examiners on a per diem basis and a full-time nurse are employed. Nearly 1 per cent of the youths have been found to have suspicious or active tuberculosis.

Under the federal plan for Vocational Education for National Defense,

tuberculosis case-finding is carried on among those who are being trained as defense workers in the local Apprentice Training School, in the Aviation Training School, and in the Vocational High School shop classes. On June 27, 1941, a special staff of physicians was employed through federal funds, and under the supervision of the Syracuse Board of Education, to make health examinations of all trainees and give them health counseling. All trainees are tuberculin tested, after which the positive reactors are X-rayed by a technician from the Sanatorium, where the films which are paid for through federal money, are interpreted by a Sanatorium physician.

Up to the end of May, 1942, the number of trainees who were X-rayed totalled 1,458. Of these, 13 were found to have active pulmonary tuberculosis, 12 were suspicious, 16 others were placed under observation, and 38 were found to have an arrested pulmonary condition. This gave a yield of 0.9 per cent with active disease, and an additional 1.92 per cent also needing medical follow-up.

Case-Finding Among High School Students

Tuberculosis case-finding surveys have been carried on for the past eight years in local public and parochial senior high schools by the School Health Service, with the cooperation of the Bureau of Tuberculosis. Attention has been focused especially upon the students in the eleventh and twelfth grades, that is, upon juniors and seniors. Students in the City Normal School and the Continuation School have also been covered.

All high school students in these two grades as well as those in the other schools just mentioned who have not previously had a tuberculin skin test, or who have previously been found negative, are offered the privilege of such a test. The test is administered upon parental request. Those whose reaction shows infection are given the opportunity to have a chest X-ray. About four-fifths of the junior and senior students are examined.

The findings in these surveys are shown in the following table:

School year	Tuberculin tests read	Positive reactors	Percentage of positive reactors	X-rayed	Suspicious and in need of medical supervision	Active cases in need of sanatorium care
1934 - 35	2,144	745	34.7	629	76	11
1935 - 36	2,120	703	33.0	637	51	8
1936 - 37	2,355	843	35.8	771	32	7
1937 - 38	3,739	1124	30.1	1058	64	2
1938 - 39	2,032	294	14.5	242	8	1
1939 - 40	1,912	223	11.6	193	14	-
1940 - 41	2,059	222	10.7	180	11	1
1941 - 42	2,270	264	11.6	238	20	2

All told, 32 boys and girls have been found to have active tuberculosis, and 276 have been found with a suspicious condition calling for further medical attention. As a result of the examinations, 16 of the pupils - 13 of them girls, and 3 boys - have entered the Onondaga Sanatorium. In two instances where the parents delayed giving their consent to letting their children be hospitalized, the children died from tuberculosis.

It is interesting to note that two of the foregoing students after having been proven to be a positive tuberculin reactor, and after giving no evidence of disease when X-rayed, were found by a follow-up X-ray the next year to have developed active pulmonary tuberculosis.

If all high school students in the upper two grades, instead of only about four-fifths of them, were tuberculin tested, and where necessary were also X-rayed, still more cases of active disease might have been discovered. In the cases of positive reactors who do not report for the X-ray part of the survey, the director of the School Health Service sends the parents a letter explaining the importance of the recommended follow-up, including the taking of a periodic chest X-ray.

Notwithstanding the relatively small number of high school students found with active tuberculosis and in need of medical attention, these annual school surveys should be continued. In addition to furnishing health benefits to individual boys and girls at an age when health protection is of key importance, and in addition to protecting other pupils from possible infection, the surveys are educationally valuable.

Examination of Students in University and Nursing Training Schools

An interesting piece of tuberculosis X-ray case-finding among a slightly older group is that conducted by the Health Service of Syracuse University, which has been one of the pioneers in this type of work in American universities. This program has developed to a point where at the present time all entering students in all colleges in the University, must, as an entrance requirement, present a report of the results of a tuberculin test, and in cases where the student is a positive reactor, a report also of his chest X-ray. After admission, all students with a previous negative skin reaction are retested each year, and in case the tuberculin test has become positive, they also receive a yearly chest X-ray. Special examinations at other times are also given when they may be needed. Most of this work is done at the Student Infirmary.

Although tuberculosis is comparatively rare in the economic levels represented by college students, the findings in our local University have demonstrated the importance of these procedures, as indicated by the following statistics for the past five years:

Results of examinations	1937-38	1938-39	1939-40	1940-41	1941-42
Tuberculin tested	729	876	1,210	1,887	1,777
Positive reactors	350	494	451	618	491
Percentage of positive reactors	48	56	37	33	
X-rayed	558	890	904	1,292	1,232
Active pulmonary tuberculosis	9	0	10	6	3
Suspicious pulmonary tuberculosis	5	0	0	4	4
Students leaving University to enter a sanatorium	2	0	5	4	3
Students under continuing medical observation	-	-	-	19	10

During the past five years 28 students have been found with active tuberculosis, of whom 14 had to undergo sanatorium care. Two years ago four of the students who had to withdraw from the University for this purpose, had been residing in the same house. Such a condition points to the strong probability that some of these students had picked up the infection from a positive-sputum case living in the same place.

In some instances a high school student having a positive tuberculin skin test, but a negative chest X-ray while in high school, has later entered Syracuse University or some other university, and has there been discovered, through the examination by the university health service, to have developed active lung tuberculosis. This shows the importance of having all adolescents who bear evidence of this infection receive frequent periodic re-checking.

Special pains are also taken to see that student nurses in the nursing training schools connected with local hospitals receive the benefit of modern case finding measures. In one such nursing training school, for example, a committee of five members of medical staff of the hospital sees to it that the nurses-in-training have a chest X-ray at least annually, regardless of what their tuberculin test may show.

The Tuberculosis Problem Among Young Children

It will have been noted that in listing the more important groups in the community among whom case-finding efforts are most needful, young children were not included. This calls for a word of explanation.

In Syracuse, as in most communities, the emphasis in case-finding is now focused mainly upon adults and the upper-teen age. This is because tuberculosis so seldom develops into significant disease until late adolescence or

adulthood. The expenditure of public funds for case-finding should naturally be directed toward those groups where the service will prove most productive. This explains why the local school authorities have for several years limited their surveys to eleventh and twelfth grade pupils in senior high schools.

It is important, however, that all children, regardless of their age, who have lived in contact with active tuberculosis should have the benefit of a tuberculin test to learn whether they have become infected. If they show a positive reaction, they should be given the additional benefit of a chest X-ray.

It is especially important that children under two years of age be safeguarded from exposure to tuberculosis infection. This is because infants and young children are exceedingly weak in their defenses against this infection.

Negro children offer a partial exception to what was said above concerning the age at which tuberculosis as a disease ordinarily makes its appearance. In colored children the pulmonary form of the disease not uncommonly develops while they are very young.

Examination of School Teachers and Others in Contact with Children

The school health service in Syracuse has for the last few years offered X-ray examinations to public school teachers, cafeteria workers, school bus drivers, and other school personnel. As an alternative such persons are encouraged to go to a physician of their own choosing for this purpose. The object is both to protect the health interests of the teachers themselves, and to prevent the dissemination of any tuberculosis they may have to their pupils.

During the last five school years the teachers and other school employees known to have been X-rayed have averaged somewhat under 50 per year. In two schools nearly all of the teachers have had such a checking of their lungs. All teachers and other adult personnel in intimate contact with children should be examined.

An encouraging development has been the requiring for the last few years by the Syracuse Board of Education of an X-ray chest examination as part of the pre-employment medical examination of all candidates for teaching positions. The School of Education in Syracuse University demands a similar examination of all its incoming students. This is done on the ground that no one having tuberculosis should undergo training for a position where he or she is likely to prove a menace to the health of children.

There is a growing tendency in American cities to encourage or require these examinations of teachers. One thing that has stood in the way of the general adoption of these practices is the fear that the discovery of the disease may jeopardize the teachers' tenure.

There should of course be similar examinations of all other persons in intimate contact with children, as, for example, the workers in children's institutions, and the adults in foster homes where dependent children are cared for. Local child-placing agencies are to be commended for the care they exercise in this regard.

Steps have recently been taken to develop a proposed program of health examination of household workers in Syracuse whose duties bring them into con-

tact with young children. A number of American cities have experimented with such a plan. The program aims especially to prevent the spread of tuberculosis to infants and young children by nurse maids, cooks, and other persons employed in domestic service positions. The Syracuse Federation of Women's Clubs has been interested in the desirability of such a program.

Logically, parents and other adult members of any household where there are young children should likewise be examined to make sure that they are not conveying infection to the children.

Case-Finding Through Prenatal Clinics

Although it does not directly relate to case-finding, mention may be made at this point of a lying-in and delivery service inaugurated this past September at the Sanatorium for tuberculous mothers with positive sputum. Three women were delivered there during the last four months of 1941, and the babies, immediately after birth, were transferred to the children's department of general hospitals where they could be cared for without risk of contracting tuberculosis infection. In addition to protecting the new-born infants from becoming infected with this disease which is so grave in its consequences at this period of life, the new arrangement also prevents the mothers from spreading their tuberculosis germs among the patients in maternity wards of general hospitals where the deliveries would otherwise have to take place.

The ten prenatal clinics conducted by the Health Department furnish another avenue of tuberculosis case-finding. All women registered in these clinics are tuberculin tested, unless they are already known to be tuberculous or have previously had such a test. Three hundred and seventy-five of the 611 pregnant women who were so tested during the year 1941 reacted positively, and 343 of them were later X-rayed at the Chest Clinic. As a result, 4 were discovered to have active incipient pulmonary tuberculosis. One other woman gave evidence of an arrested lung condition, and 3 showed a healed pulmonary tuberculosis.

A similar procedure is desirable for all expectant mothers.

Food Handlers

The public every now and then expresses an interest in the question of compulsory health examinations of food handlers. Experience in different parts of the country has demonstrated that the medical examinations of such workers are seldom thorough or dependable.

Persons employed as restaurant workers and in other food handling positions, particularly those in the lower income brackets, are an important group to be included, however, in such mass tuberculosis case-finding surveys as may be undertaken.

Examination of Hospital Personnel and Ward Patients

For many years the Onondaga Sanatorium has made a practice of periodically X-raying its employees. Each new employee is X-rayed both at the time of his or her initial employment, and every three months thereafter during

the first year of employment. During the second year the X-rays are taken every six months, and thereafter annually or at such intervals as seem necessary. The total number of X-rays of the Sanatorium employees taken during 1941 was 372.

Certain general hospitals also routinely X-ray their nurses and hospital employees. This, too, has been productive in case-finding.

Tuberculosis authorities have often urged that ward patients in general hospitals should also be routinely X-rayed, because such patients come as a rule from those income groups where tuberculosis is most prevalent.

One of the private hospitals in Syracuse was covered by a State Health Department X-ray screening survey of ward patients made in 1937 and 1938 in 14 general hospitals in different parts of the state. Of the 455 ward patients X-rayed in this local hospital, 18, or 3.9 per cent, gave evidence of tuberculosis. Twelve, or 2.6 per cent, had active tuberculosis, and 6, or 1.3 per cent, had healed pulmonary tuberculosis. Of the former, 7 were known to be tuberculous at the time of their admission, and 5, or 1.1 per cent, were discovered to be tuberculous by means of the X-ray examination.

Examination of Institutional Inmates

Within the past year a special case-finding project has been jointly undertaken by the State Health Department and the State Department of Mental Hygiene for the examining of the inmates of State hospitals for mental disease and State schools for mental defectives throughout the State. The mortality from this cause among such persons is notoriously high. The employees of these institutions are also being examined. Through the return of patients to their home communities, and through visits by relatives at the institutions, positive sputum cases in such an institution can easily spread the disease to the territory served by it.

The Onondaga Sanatorium staff has lately conducted an X-ray survey of the persons living in the County Home. It resulted in the finding of a number of cases of tuberculosis.

Suitable provisions should be made for discovering tuberculosis among the prisoners in the Onondaga Penitentiary.

There is reason to believe that similar studies elsewhere, as among the persons residing in private homes for the aged, might also reveal worthwhile results.

Military Examinations

The nation-wide X-raying of selective service registrants, running as it has into the examining of millions of men, has already resulted in the finding of numbers of cases of tuberculosis. Those discovered to be tuberculous - somewhat over 1 per cent of the registrants - are excluded from the Army. At the same time the examinations by the Navy and the Marine Corps are also uncovering other previously undiscovered cases of tuberculosis. As time goes on, and especially when the older age groups are covered, these examinations will unquestionably send increasing numbers of local men into the Onondaga Sanatorium. These efforts on the part of our Army and Navy medical services constitute the most gigantic tuberculosis case-finding activity ever

undertaken, and the benefits accruing therefrom are bound to be far reaching.

Case-Finding Among Women

While the military medical examinations are causing more men than ever before to have a chest X-ray, there has as yet been no comparable increase in tuberculosis case-finding efforts among women. Inasmuch as large numbers of women are now being employed in Syracuse industries in connection with the war effort, the number of women receiving a chest X-ray for the first time should be materially increased in the near future. But this will still leave a sizeable reservoir of possible cases of undetected tuberculosis among the other women in our city who should likewise be examined.

No greater boom to the campaign for the better control and eventual eradication of tuberculosis could be imagined than a movement to induce the female half of our adult population to do, of their own free will, what such a large part of the male population have been compelled to do. This situation constitutes a challenge for Syracuse women. They can make a significant contribution to public health progress, and at the same time safeguard their own welfare, by volunteering to have chest X-rays. Such a movement by the women of Syracuse would be an epoch-making step.

Laboratory Examinations

As with other communicable diseases, a basic necessity in the control of tuberculosis is an efficient laboratory service for the making of bacteriological and other examinations. The Chest Clinic, the Onondaga Sanatorium, and the medical profession throughout Onondaga County receive this type of service from the well-equipped Bureau of Laboratories of the City Department of Health located in the College of Medicine.

The Laboratory also provides Syracuse physicians with tuberculin to be used by them in performing skin tests.

Recommendations

4 - The most important single need in the Syracuse tuberculosis program is to develop more extensive case-finding. This endeavor should be directed toward discovering each and every person in the city who has tuberculosis and the stage of the disease. The earlier it is discovered, the better.

5 - The case-finding efforts should be focused especially upon those individuals and groups of people where tuberculosis is most likely to exist. The ages which most need to be covered among women are from 18 to 35 years of age, and among men, from 18 to 45 years of age. The examination of older persons is also desirable. The examination of persons with apparent symptoms of the disease, and of those who have been in contact with it, gives an especially high yield in the detection of new cases. Persons in low-income brackets, industrial workers, certain other important large groups, and persons who are apparently well, also need to be examined.

6 - The most efficient and dependable single means of determining

whether persons have tuberculosis is through the X-ray examination of the chest. In addition to being of indispensable value in demonstrating pulmonary tuberculosis, the X-ray offers the only means by which this form of the disease can be detected in its earliest or minimal stage, when it is most curable and least likely to be infectious. The success of the local case-finding efforts will depend largely upon the extent to which this method of examination is used. Each year thousands of people in Syracuse should be so examined, and, many of them ought to have such an examination not just once, but periodically. Information concerning the willingness of private physicians to make X-ray examinations of the chest of persons of moderate financial means at a moderate fee, should be more widely publicized.

7 - The most practicable and economic method of making X-ray examinations of many large groups of persons, is through mass surveys. Under this plan, instead of having the persons go to a physician or clinic for their X-ray, the physician and the X-ray machine go to the place or neighborhood where such persons can most conveniently be brought together. This approach is especially adapted, for example, to case-finding efforts among industrial workers and neighborhood groups.

8 - The Health Department, in addition to owning its own X-ray equipment for routine use for individual cases at the Chest Clinic, needs, and should own, its own modern rapid-action X-ray machine for making mass surveys. The latter equipment must be of a type which can be transported from place to place, and which can take X-ray pictures at the rate of 100 per hour, and at a small cost. The outlay for this equipment, depending upon the type, will range from $6,500 to $10,000. The costs of transportation, materials, processing, and incidentals should also be met through public funds. The necessary additional expenditures for these items would be approximately $1,200 per year.

9 - When such X-ray equipment is secured, the Bureau of Tuberculosis will need the services of a full-time, specially qualified physician at a salary of $5,000 per year, and an X-ray technician at $1,800.

10 - The Tuberculosis Bureau and the Chest Clinic of the Health Department should, as early as practicable, be housed in adequate and better quarters.

11 - Far larger numbers of persons than at present should have the benefit of the tuberculin skin test, which reveals those infected.

12 - The successful carrying out of the broad and persistent case-finding effort which Syracuse needs, calls for the active cooperation of numerous citizen organizations and groups. Such cooperation is particularly needed, for example, on the part of industry, labor, and other agencies that are in a position to enlist interest and the willingness to be examined.

PART III. - CASE-CONTROL

Preventing the Spread of the Infection

The eradication of tuberculosis in Syracuse will be possible in proportion as new cases of the disease can be prevented. It is not enough that tuberculosis patients be restored to health through treatment. Paralleling the effort to promote cure, the tuberculosis program must protect the public against the spread of the disease to additional persons.

This necessity of suitable protection, or case-control, grows out of the fact that tuberculosis is a germ disease and communicable. The public interests are only partly guarded when such control measures center about those patients with known positive sputum, that is, sputum containing the germs of tuberculosis. For patients with negative sputum may, as already pointed out, later become positive. Supervision and control over tuberculosis patients should therefore continue for as long as the patient either has positive sputum, or is capable of developing positive sputum.

Unlike many communicable diseases that last only a short time after which the patients are free from the disease, tuberculosis is a chronic disease, and the patient may be a carrier of his infection for years. Another characteristic feature of tuberculosis is its tendency to relapse, and each time a patient suffers a relapse, the likelihood of spreading the disease to others is increased. Because tuberculosis is so long lasting, and because this tendency to reactivate makes it so unstable and unpredictable, the case-holding and other means of control must be correspondingly long-ranged.

The task of preventing the scattering of the infinitesimally small, but dangerous tuberculosis germs is many-sided, and calls for a high degree of skill and teamwork. There is no drug which can disinfect a tuberculous individual and render him safe. In this regard tuberculosis is entirely different from such diseases as syphilis and gonorrhea in which the administration of certain drugs can not only eventually kill the germs, but can, even before that, make the patient non-infectious. The safeguarding of the public health in the case of tuberculosis depends in part upon the conduct and cooperation of the patient, in part upon the physician and others who are looking after him, and in part upon the efficient functioning of the machinery and procedures of public health agencies.

The problem becomes very difficult when the patient is uninformed and uncooperative, and especially if he is negligent and irresponsible. Increased responsibility must then be exercised by the health officials. If education and friendly persuasion fail, the use of legal authority, even to the extent of invoking compulsory measures, may become necessary.

Reporting of Cases

One of the pre-requisites of case-control is naturally an active, community-wide case-finding effort. An efficient program of treatment, and proper rehabilitation measures, also have significant bearings upon the control

of the disease. These subjects are discussed in other sections of the Report.

It is customary, however, to think of case-control more especially in terms of certain other measures. Case-reporting is one of these basic requirements. For unless the public health authorities know of the existence of all cases of tuberculosis, and where to look for them, they cannot exercise the needed control against the spread of the infection. The Public Health Law therefore requires that every physician, upon diagnosing a case of tuberculosis, shall forthwith file a confidential report of the case with the City Health Department. The reporting of cases by Syracuse physicians is faithfully done. Obviously, however, the efficiency of the reporting depends in the first instance upon the promptness with which those who have the disease seek medical examination. After this first step, there must also be prompt and accurate diagnosis by the physician.

Notwithstanding what has just been said concerning the generally satisfactory status of the local reporting of cases, once they have been diagnosed, there are, in Syracuse as in almost all places, a number of patients in the advanced stages of the disease whose cases are not discovered and reported until late. During the three years from 1938 through 1940 as many as one-quarter of those dying from this cause in this city had never previously been reported as having the disease. In 1941 this was true with respect to one-fifth of those dying from tuberculosis. These and other facts concerning the reporting of cases are shown in the following table.

Length of time reported	Deaths 1938 - 1940		Deaths in 1941	
	Annual average	Per cent distribution	Number	Per cent distribution
All deaths	70	100.0	84	100.0
Cases reported before death	53	75.4	68	80.9
Less than 1 month	6	10.8	8	8.8
1 month under 1 year	15	28.1	28	41.2
1 year, under 3 years	15	28.2	14	20.6
3 years and over	17	32.9	20	29.4
Cases reported after death	17	24.6	16	19.1

Supervision by Public Health Nurses

Another essential for the prevention of the spread of tuberculosis is the continuing supervision by the Health Department of all tuberculous patients, with regard to both their whereabouts and the status of their disease. The public health nurses working under its Nursing Bureau are empowered to visit all persons having tuberculosis, to instruct the patients and the members of their household concerning needed protective measures, and to perform such other duties as may be appropriate and necessary. The health commissioner may require such nursing visitation even when the patients are under the care of a private physician. From the point of view of case-control, this supervision by public

health nurses, whether exercised before the patient enters the Sanatorium, after the patient returns homes, or in the cases of those who receive no sanatorium care at any time, is highly important.

The public health nurse reports the information which she secures concerning the patient's whereabouts, living conditions and health behavior to the medical staff of the Tuberculosis Bureau. She also gives the patient needed health counselling concerning the ways to avoid endangering the health of other persons. No one is in a better position to provide this kind of instruction than the nurse who goes into the home. The effectiveness of her supervision and instructions is naturally conditioned by the frequency with which she sees the patient, by the skilfulness with which she works, and by the degree to which she wins the confidence and good will of the family. A timely home visit, as, for example, on an occasion when she can supply guidance or assistance concerning the proper care of a cold or some other illness, may have far-reaching effects in warding off a relapse, or in otherwise preventing the spread of the infection to others.

Case-Holding or Periodic Medical Re-Examinations of Patients

Owing to the instability of tuberculosis and to the tendency of arrested cases to become active again, it is extremely necessary that those having the disease shall receive a medical re-examination periodically. Here again the public health nurse holds a position of strategic importance. From the point of view of community protection against this disease, no more vital duty is entrusted to her hands than that of using every means in her power to induce patients to be re-examined as the case requires.

A regime of these periodic re-examinations should, as a rule, be carried out for several years, sometimes for the rest of the person's life. The desirable frequency of such medical re-checkings depends upon the stage, activity and other circumstances of the individual case. The control aspects of the local tuberculosis program can be no stronger than its case-holding and the adequacy of this needed medical oversight.

Patients under the supervision of the Tuberculosis Clinic of the City Health Department are usually examined at least once every two to six months, depending upon the factors in the case. The examination includes an X-ray and a sputum examination. In the Onondaga Sanatorium all patients are given a thorough re-examination at least monthly, with an X-ray every three months or oftener. An attempt is also made to examine the sputum each month. From a medical angle, all persons under the care of a private physician should be similarly looked over, with a corresponding degree of frequency.

Supervision and Control of Patients with Respect to Sputum Status

Patients with positive sputum are naturally the most dangerous. The extent to which such a person is a menace depends largely upon his exercise of proper personal precautions. Yet in every case of pulmonary tuberculosis the responsibility rests upon the public health authorities, and also upon the private physician if there is one, of carrying out suitable surveillance and other measures to help prevent the scattering of the germs.

Patients with negative sputum, as already explained, may, without warning, develop sputum that is positive. In other words, the fact that a certain specimen of sputum produced by a patient is negative, is no proof that the next specimen may not reveal the presence of the dangerous tubercle bacilli and be infectious. Even when the sputum of patients is negative, it may therefore be "potentially positive." These "occasional positive sputum" patients, as they are termed, are particularly in need of frequent re-checking. In view of these facts, and in the interest of public safety, it is desirable to regard even those with negative sputum as potentially infectious and as therefore requiring repeated sputum examinations.

In the case of Sanatorium patients, as well as among those who are being followed up by the Tuberculosis Clinic of the Health Department, those who have negative sputum are sometimes given a dozen or score of successive examinations, and also several different methods of examining the sputum are employed, in an effort to make sure that no change in status has occurred. Equal pains should be taken in all cases of tuberculosis.

The Committee reviewed the report of the Tuberculosis Bureau for the year 1940 with special reference to the sputum status of 438 patients whose disease was active. Their classification and the nature of the supervision they were receiving are shown in the next table:

Sputum status	Total patients	Under hospital care	Under medical care and public health nursing supervision	Under medical care but not public health nursing supervision
Total	438	198	198	42
Positive	175	107	50	18
Negative	120	47	68	5
Unknown	143	44	80	19

One hundred and seventy-five of the patients with active tuberculosis had known positive sputum; 120 had known negative sputum, and in 143 instances the sputum status was for one reason or another unknown.

Of those with active tuberculosis, 240, or 55 per cent, were at home or elsewhere than in a hospital. Of those with both active tuberculosis and known positive sputum, 68, or 39 per cent, were at home or elsewhere than in a hospital. It is a matter of serious import that so many non-hospitalized persons were coughing up tuberculosis germs, which in many cases makes them a danger to their family and the community. As long as this condition continues, the eradication of tuberculosis from Syracuse will be correspondingly difficult.

Of those with negative sputum (which in some cases may without warning become positive) 73, or 61 per cent, were at home. Of those with unknown sputum status, 99, or 69 per cent, were living at home. Forty-two of the persons having active tuberculosis and living at home were having no public health nursing supervision, in spite of the fact that the Health Department stands ready to provide this service.

In 67 other cases it had either been impossible to make a medical examination of the patients, or the examinations were inconclusive as to whether the disease was active or inactive. In none of these 67 cases had there been a recent sputum report. In 21 additional instances the whereabouts of the patients had become unknown.

Isolation of Patients through Hospitalization

The best guarantee against the conveying of tuberculosis germs to other persons is through sanatorium care of the patient. Sanatorium care provides protection for the public health, first, by segregating or isolating the patient during the period of his hospitalization from those who might otherwise become infected. Second, it provides the opportunity for remedial and curative treatment, which, in a considerable proportion of cases, either temporarily or permanently stops the development and escape of the tubercle bacilli. Third, it educates the patient to dispose properly of his sputum and to exercise necessary precautions after he leaves the hospital.

Authorities are agreed that the greatest single control factor in bringing about the decline in tuberculosis, both in the United States and in foreign countries, has been the growing practice of isolating infections, and potentially infectious, patients.

Compulsory Hospitalization

Public health officials and physicians are naturally reluctant to enforce needed sanatorium care through court action. They rightly prefer to depend as extensively as possible upon education and persuasion. Yet in the interest of safeguarding public health, in certain cases the situation becomes so serious as to demand compulsory hospitalization.

Any person, known to have tuberculosis in an infectious stage, who wilfully fails to exercise reasonable precautions against conveying his infection to other persons, whether in his home or elsewhere in the community, can be taken before the magistrate of the Court of Special Sessions, either under section 326-a of the Public Health Law, or under section 1,740 of the Penal Law. Under section 326-a of the Public Health Law, the magistrate, upon proper proof of the charge, is empowered to commit the person to the Sanatorium. Under the Penal Law, the magistrate can convict the person of a misdemeanor, and then commit him to the Penitentiary for not exceeding six months. However, the Penitentiary is not equipped to segregate and properly look after tuberculosis patients, and furthermore the patient might spread his infection to others in the Penitentiary. As an alternative disposition when this latter section has been used, the magistrate has suspended sentence and made it a condition of such suspension (medical probation) that the person go to, and remain in, the Sanatorium.

The Committee believes that the time has come when the health commissioner, or his representative, namely, the director of the Bureau of Tuberculosis, should make more frequent use of legal action in enforcing the hospitalization of positive-sputum tuberculous patients who otherwise endanger the public health. The principle involved is the same as in a case of smallpox or any other communicable disease, where it becomes necessary to enforce isolation. Such judicial steps should of course be used only under exceptional circumstances when no other method will avail.

Control of Sanatorium Patients

After patients enter the Sanatorium it is important that they remain there as long as necessary to enable them, not only to derive personal benefit from its treatment facilities, but also to prevent them from spreading their

infection in the community. Although practically all of the patients in the Sanatorium are there on a voluntary basis, they are supposed not to leave except upon approval by the medical staff.

Each year, however, numbers of patients, some of them with positive sputum, leave the hospital against medical advice, and by so doing endanger the public health. They leave either on their own accord, or at the urging of their family, and for a variety of reasons. Such discharges are called "voluntary discharges."

Another kind of difficult situation and menace to public health is created when a patient in the Sanatorium becomes so disorderly and unmanageable as seriously to interfere with its administration and with the morale and welfare of other patients. These problem cases are complicated by many forms of personality and social mal-adjustment. No other recourse is left to the superintendent, in the more extreme cases, than to discharge the patient, notwithstanding that it may entail the risk of his scattering tuberculosis germs in the community. Discharges of this recalcitrant type of patients are termed "disciplinary discharges."

The number of such voluntary discharges against medical advice during the past decade totaled 504, and the discharges for disciplinary reasons totaled 35. The distribution by years is indicated in the following table:

Year	Voluntary discharges against medical advice	Disciplinary discharges for misconduct
1932	44	5
1933	58	4
1934	56	3
1935	46	2
1936	64	3
1937	59	0
1938	53	7
1939	44	6
1940	34	1
1941	46	4

Discharges of these two types occur with much frequency throughout New York State. Sanatorium authorities naturally strive to do all in their power to keep such patients under hospital care. Each case must be dealt with individually, and a variety of preventive measures are often called for. In so far as possible an effort is of course made to handle the situation through educational and persuasive means. This subject will be further discussed in Part IV. on Treatment.

The Committee believes that these problems, which exist in all parts of the State, deserve to be studied from all angles. In spite of everything that can be done through educational means, there will doubtless continue to be some of these uncooperative, irresponsible and incorrigible patients who can be successfully dealt with only through compulsory measures.

These cases would seem to call for the conferring of legal authority upon the superintendents of all public sanatoria which will enable them to resort to a judicial remedy, when all other recourses have failed. Proper

facilities should at the same time be provided not only for suitable hospital care, but also for the needed custodial restraint in one and the same institution. The existing county sanatoria seldom provide this combination of facilities. The most practical means of meeting the situation might be to have the State Health Department set aside and administer special quarters for such patients in some centrally located upstate sanatorium, to which the more uncontrollable patients might be committed through court action.

Case Roster

Anyone acquainted with tuberculosis work cannot but appreciate the importance of accurate and adequate records. The Tuberculosis Bureau has for years maintained a valuable confidential alphabetical index of cases classified as to various major factors. This greatly assists the medical director of that Bureau and the public health nurses in keeping informed concerning the status and needs of all tuberculosis patients.

With the cooperation of the State Health Department this index has recently been supplemented by the creation of a new visible index roster which includes the names also of known contacts. Through this tickler system and depository of confidential information, the medical director can now tell at a glance which tuberculosis patients need to be given another medical examination, a chest X-ray, or a sputum examination, or to be visited by a public health nurse, as the case may be, and also which contacts need to be followed up at any given time.

For the upkeep and proper utilization of this indispensable adjunct to the work of the Tuberculosis Bureau its records must be kept constantly up to date. A single clerical error or oversight may have serious results, not only to the patient, but to the community.

Inter-Agency and Inter-Community Exchange of Information

A medico-social problem like tuberculosis calls for the cooperation of many different community agencies. Sometimes half a dozen or even a dozen different departments and organizations may have relationships or important information concerning the same tuberculous family. To prevent duplication of effort and working at cross purposes, the information possessed by other agencies should, in many cases, be made available to the local health authorities or to other agencies providing either medical or rehabilitation treatment. Such an exchange of information and promotion of teamwork is facilitated by the services of the Social Service Exchange, one of the Community Chest agencies.

There must also at times be an exchange of information and a proper coordination of efforts on the part of public health authorities and other agencies in different communities. The assistance rendered by the State Health Department, especially with reference to persons moving here from other counties, or moving from Onondaga County to other counties, is often of great value in connection with such inter-community control efforts.

As the different aspects of the local tuberculosis program are described in this Report, it will become increasingly evident that the situation covering each individual patient needs to be looked at from many different angles, - case-finding, prevention of the spread of the infection, treatment, health education, after-care, rehabilitation. All agencies participating in the

local tuberculosis program, should have a common understanding of the standards, policies, and methods to be carried out. These two requirements call for certain administrative supervision and control. The general administrative responsibility for the efficient working of the tuberculosis program in Syracuse devolves upon the medical director of the Tuberculosis Bureau, and in part also upon the tuberculosis supervising nurse who works under his direction.

One of the most effective means of keeping informed concerning the developments and needs in individual cases, and of securing the requisite agreement among different agencies as to approved policies and methods, is through the periodic study and review of individual cases and through conferences of representatives of the various agencies.

Cooperation between the Bureau of Tuberculosis of the City Health Department and the Onondaga Sanatorium is assured through the fact that the health commissioner is a member of the Sanatorium Board of Managers, and that the director of the Tuberculosis Bureau is a member of its consulting staff, and also through the further fact that a member of the medical staff of the Sanatorium serves as one of the examining physicians in the Chest Clinic. Unfortunately this latter arrangement has recently had to be temporarily suspended, owing to the calling away of so many of the Sanatorium physicians for military service.

Recommendations

13 - Increased attention should be given to bringing about the isolation and supervision of patients having positive sputum, so as to prevent the spread of the disease to other persons. The local program for the after-care and supervision of persons with active or arrested tuberculosis, carried on by the Tuberculosis Bureau and the Nursing Bureau of the Health Department, should be intensified.

14 - When patients with active tuberculosis, after being duly warned and instructed, neglect or refuse to exercise proper precautions, the Health Department should more frequently take the necessary steps to bring about their compulsory hospitalization. When patients with positive sputum in any public tuberculosis sanatorium, anywhere in New York State, leave against the advice of its medical staff and thereby endanger the health of other persons, or when patients with active tuberculosis so conduct themselves while in such a sanatorium as to interfere with its administration or the welfare of other patients, the superintendent of the sanatorium should possess authority to institute legal proceedings for their compulsory hospitalization in a place, which is equipped to provide not only needed medical care and treatment, but also suitable custodial restraint. The Committee recommends that a State-wide study be made of the problems presented by uncooperative and unmanageable patients in different parts of the State. Legislation on the subject would seem desirable, and a practical solution may be through authorizing the State Health Department to set apart special quarters for this purpose in one or more hospitals, suitably located, and administered by that Department.

PART IV. - TREATMENT

It would be quite outside the province of this Report to discuss details of medical treatment, for these are matters wholly within the hands of the physician handling the individual case. The Committee therefore limits its discussion of treatment problems to those administrative and other phases which are of more immediate concern to the lay public.

The medical care and treatment of Syracusans having tuberculosis is provided (a) through the local medical profession, (b) through the Chest Clinic, (c) through the Onondaga Sanatorium, and (d) through other hospitals. These phases can best be described and commented upon by referring, first, to the services and problems at the local Sanatorium.

Onondaga Sanatorium

The Onondaga Sanatorium is a public hospital operated under the state-wide provisions of the County Law, and under the general supervision of a Board of Managers of five persons appointed by the County Board of Supervisors. The plant consists of 133 acres of land beautifully located in Onondaga Hill and overlooking the city of Syracuse, and has a total of four hospital buildings, all but one connected by subways, plus a heating plant. It represents a tax investment of $849,190.

The Onondaga Sanatorium is a well-equipped hospital providing modern methods of treatment, and is the treatment center for most of the tuberculosis patients in Syracuse and Onondaga County who are hospitalized. Its capacity varies from time to time, according to the utilization made of the different rooms. In 1941 the average number of beds was 250, and by the end of the year the number of beds was increased to 265. About two-thirds of the beds are available for Syracusans. It is usually filled to capacity.

From the time it was opened in October 1, 1916, to October 31, 1941, the Sanatorium cared for 4,913 patients. The admissions during the year ending October 31, 1941, numbered 265, of which 191 were from Syracuse, 68 from towns and villages in Onondaga County, and 6 were paid patients from other counties. Of the total number of patients admitted during this twelve months' period, 65 represented re-admissions. The discharges during this period, in addition to the 56 patients who died, totalled 173. The patients remaining in the hospital at the end of the year numbered 237. In recent years the Sanatorium has annually provided care, during part or all of the year, for somewhat over 400 patients annually.

At the time of their admission, 36 of the patients received during the past year were under 20 years of age, 129 ranged from 20 to 39 years of age, 88 from 40 to 59 years, and 13 were 60 years old or over. Fifty-four per cent of them were or had been married. Fifty-one of those received for treatment were housewives, 43 laborers, and 21 students.

Two hundred and two of the new patients had tuberculosis in its pulmonary form - 27 in a minimal stage, 44 in a moderately advanced stage, and 131 in a far advanced stage. Twenty-six had non-pulmonary forms of tuberculosis. The others were admitted for observation purposes, or were ultimately diagnosed as having other disease conditions. At the time of their admission, 106 patients

had positive sputum, 95 negative sputum, and in 64 instances satisfactory sputum specimens for laboratory purposes could not be secured.

The patients are admitted to the Sanatorium on application to the superintendent. They are received on the basis of their medical condition without regard to their ability to pay for their care.

The Sanatorium has a professional and maintenance staff of 160 employees. It also has a medical consulting staff which was created during the past year.

Treatment Methods

The modern tuberculosis Sanatorium is in every sense of the word a true hospital. It is no longer a lean-to where patients merely rest in the "fresh" air. Unless it provides approved modern methods of therapy, it cannot do its work efficiently. The Onondaga Sanatorium is a hospital of this type.

The treatment of tuberculosis patients calls for special knowledge and much skill. Whether hospitalized or not, the patients must be kept under close and long-continued medical supervision. Patients vary greatly in their reactions to the disease and in their treatment requirements. The therapeutic measures must therefore be adapted to the individual.

In spite of what has just been said, the treatment of tuberculosis patients is still built mainly upon a program of rest. Many of them have to be strictly confined to their beds for months or years. Those whose progress justifies such a course are permitted to be up and about at least part of the time, but under a regime of restricted activity.

This plan of rest treatment upon which the healing of the diseased lung tissues so largely depends is further promoted, in selected cases, by certain chest surgical procedures. This is accomplished by immobilizing the diseased area and thereby stopping the use of that portion of the lung. Patients whose condition would formerly have been deemed hopeless are now being restored to health by modern chest surgery. About a third of the patients are suitable for this mode of treatment.

The most commonly used of these artificial methods of inducing rest for the diseased lung tissues is pneumothorax. This form of treatment consists of the injection from time to time of air into the pleural cavity, the bag-like structure between the outer surface of the lung and the inside of the chest walls. Pneumothorax not only gives the affected part of the lung a better chance to heal; it also checks the multiplying and giving off of the germs. Pneumothorax was undertaken during the year ending October 31, 1941 in 43 new cases. Those still under such treatment at the end of this period numbered 96. The injection of air has to be renewed from time to time, and the total refills at the Sanatorium during these 12 months aggregated 3,674. Members of the staff of the Sanatorium also carry out other types of chest surgery. The patients requiring thoracoplasty, commonly known as the "rib operation" are transferred to the State tuberculosis hospitals for the purpose of having it performed.

In addition to the X-ray study made of each patient upon admission and at the time of discharge, all patients are radiologically examined every three months, or oftener as may be required. Pneumothorax cases are X-rayed

monthly. The total number of films used in the cases of Sanatorium patients during the past year was 1,604. (This is exclusive of 434 films used in the checking of former patients, and 1,908 used by its out-patient clinics.)

Routine sputum examinations and other laboratory tests are also made. This work is done both at the Sanatorium and at the City Laboratory.

Length of Treatment

The stay of patients in the Sanatorium must of necessity vary with the individual. The stay has to be long enough to improve their physical condition, to educate them concerning the proper care of their disease and concerning needed precautions, and to fortify them against a breakdown. This latter possibility must constantly be borne in mind, for such healing as may take place in the lungs is often unstable and not infrequently followed by a relapse. These facts make the treatment of tuberculosis a long drawn-out affair.

The average length of stay on the part of the patients who left the Sanatorium during the year ending October 31, 1941, was nine months. Their stay ranged from one day to four years and eight months. A number of those still in the Sanatorium have been there for 10 to 25 years. This is in marked contrast to the stay of patients in local general hospitals which average about nine and one-half days.

Patients Leaving the Sanatorium Against Medical Advice

In view of the long duration of the treatment ordinarily required for tuberculosis, it is not surprising that some patients desire to leave the Sanatorium before it is wise for them to do so. That some of them become restless and discouraged and wish to return to their families, especially when they are worried about conditions at home, is almost inevitable. This is especially true, for example, when the patient has been gaining in weight and again looks and feels quite well, as so many of them do in spite of the fact that their improvement is of uncertain permanency, and when members of the patients' own family urge their return home, as they so often do.

The Sanatorium uses a variety of means in trying to hold its patients as long as necessary. One of the basic means of keeping them contented is by furnishing them not only a high quality of medical care, but also an environment and an atmosphere that are as pleasant and friendly. One of the essentials in this connection is a satisfactory diet.

Another means that encourages the patients to remain in the Sanatorium is their education concerning the nature of the disease and the great importance of adhering to the treatment rules. Instruction concerning the tendency of the disease to re-activate must be given not only to the patients themselves, but to other members of their families as well. They should be taught to see the whole problem of tuberculosis treatment in proper perspective, with a full understanding of the long regime of correct health conduct which it calls for.

Utilization should finally be made of friendly suasion, social work resources, and rehabilitation measures, to the end that the patients may realize that it will redound to their practical advantage to abide by the advice given them by the Sanatorium staff. Some of these phases will be further discussed in Part V. on Rehabilitation.

Results of Sanatorium Treatment

The outcome of the treatment provided at the Onondaga Sanatorium in individual cases may be measured in two ways. One is on the basis of classification of the condition of the patients at the time of their discharge.

During the ten years ending December 31, 1941, the number of patients discharged was 1,773. The number who died was 467. Most of these did not enter the hospital until their disease was far advanced. The number reported as improved was 1,292 or 62 per cent. Roughly, two out of every three was believed to have been benefited.

The second and sounder way of judging results is by the follow-up of the patients and an appraisal of what happens after a given interval of time. A study of the results of the treatment of 79 pulmonary patients discharged from the Sanatorium in 1933, as measured over a five-year period ending in 1938, was made in 1940 by the National Tuberculosis Association with the cooperation of local health agencies. Fifty-six of these patients were still living at the end of the five-year period, 18 were dead, and in the other 5 cases information concerning their latest whereabouts and conditions could not be ascertained. Of those who were still alive, 27 were working, 14 were at home but not working, 10 were back under sanatorium care, and in 5 the information was incomplete.

The study of these 79 patients discharged from the Sanatorium in 1933, brought out a close correlation between the stage of the disease at the time of the patients' original admission to the Sanatorium, and the outcome five years later. The facts are shown in the following table.

State of Disease at Time of Discharge	Condition Five Years Later			
	Total cases	Living	Dead	No Information
Minimum	6	5	1	-
Moderately advanced	21	15	3	3
Far advanced	52	36	14	2

Of those in the minimal stage at the time of their admission, 83 per cent were still alive; of the moderately advanced cases 71 per cent were known to be alive, and in the far advanced cases 69 per cent were reported as still living.*

Of the patients who left with the approval of the medical staff, 84 per cent were still living. Of those who left against medical advice, 43 per cent were still living.

Further evidence of what happens in the subsequent history of individuals having this unstable disease is shown by the analysis of the readmissions to sanatorium care, as revealed through this investigation. Out of

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* The comparable results for the nation-wide study were as follows. Of those in the minimal stage at the time of admission, 75 per cent were still alive after 5 years; of the moderately-advanced cases, 60 per cent were living, and of the far-advanced, 33 per cent were living.

the total of 79 persons involved in the study, 40 are known to have again become sanatorium patients, and others may have entered other sanatoria. Of those discharged after approval by the medical staff, 41 per cent were re-admitted. Of those discharged against medical advice, 62 per cent were re-admitted.

These facts strongly emphasize the importance of (a) getting patients under sanatorium care just as early as possible; (b) of keeping them in the sanatorium until they are in a satisfactory condition to leave, and (c) of seeing that after their discharge they live under suitable conditions and have the benefit of the best possible medical, public health nursing and rehabilitation services.

Free Treatment For Sanatorium Patients

Tuberculosis sanatoria throughout the State are looked upon not as charitable or welfare agencies, but as health agencies. As previously indicated, patients are admitted to these public hospitals regardless of their own economic status, and solely on the grounds of their physical condition and needs. The care of tuberculous patients in sanatoria is at the same time important for the protection of the public health.

Reference has already been made to the fact that very few of the patients in the Onondaga Sanatorium can afford to pay for their own care. About 98 per cent of the annual cost of maintenance of this hospital must be met from tax funds. Independently of the item of hospital care and medical treatment, tuberculosis ordinarily imposes heavy economic hardships upon both the individual patient and his family. To require that the person having the disease or his relatives pay for his needed care in the sanatorium may at times deter him from going there or from remaining there. In proportion as this is true, the policy of charging for the treatment is inimical to the public interest.

The Board of Managers of the institution have on a number of occasions recommended that all tuberculosis patients requiring care in the Sanatorium should receive such care and treatment entirely free of charge. The present Committee endorses this policy.

Care of Children Having Tuberculosis

In 1922 the Onondaga Sanatorium opened a special 50-bed pavilion for children. In recent years the number of children in the community requiring sanatorium care has been greatly reduced. As a result, in 1940 this building was turned over for use exclusively by older male adolescents and young adult ambulant patients. The few children still needing to be in the Sanatorium are at present looked after for the most part in a seven-bed ward in one of the other buildings.

Tuberculosis in children as well as in adults can of course invade any part of the body; but in very few boys and girls under 14 years of age are the lungs involved. Exception sometimes occurs. At present there is, for example, a seven-year-old child in the Sanatorium who has active pulmonary tuberculosis, with positive psutum, but in most of the juvenile patients the tuberculosis is in other parts of the body.

Prior to 1940, many of the youngsters cared for in the children's pavilion had a condition known as childhood or hilum tuberculosis. This is

caused by the same germs that produced pulmonary tuberculosis in adults. It represents a primary stage of the same disease which in some cases later produces the pulmonary tuberculosis found in adults.

It used to be thought that children with this hilum condition must be specially fortified against its extension to other parts of the lungs by adhering to a regime of intensified rest, nutrition, and other hygienic measures. Accordingly many such children were formerly sent to Camp Hillcrest, a private preventorium located in Fayetteville. Established in 1920 this place was finally closed in 1934 as unnecessary. Open-air classes with a special program of rest and feeding were also opened a number of years ago in certain local public schools. The trend throughout the United States in more recent years has been away from the idea of preventoria and open-air classes. The prevailing medical opinion of today is that children with this hilum condition need in most cases only good home care and separation from exposure to anyone having positive sputum. They do not need to be put into preventoria, and they can safely attend regular school classes.

It was this consideration which led the Sanatorium two years ago to discharge all children from the Sanatorium who had only the hilum or childhood type of tuberculosis.

Bovine Tuberculosis

Bovine tuberculosis formerly caused many of the cases of tuberculosis in children. This is the type of the disease met with among cattle, and is usually transmitted to humans by the drinking of unpasteurized milk.

Bovine tuberculosis was in past years quite common among human beings. Developing chiefly in childhood, it used to be extensively met with in Syracuse. It was in large part because of the prevalence of bovine tuberculosis and the long drawn-out treatment which it required, that the Children's Pavilion at the Onondaga Sanatorium was originally built. With the decreasing amount of this kind of tuberculosis in our local community, such a special pavilion for children is no longer necessary. In fact, new cases of bovine tuberculosis have almost disappeared from Syracuse and Onondaga County.

As a result of the consistent campaigns which have been carried on in New York State and throughout the United States for the tuberculin testing of cattle, and for the killing off of those that are infected, nearly all of the surviving cattle of today are free from tuberculosis. Among the 50,000 head of cattle in Onondaga County, all of which are under test, only one-fifth of one per cent of those tested last year were found to be reactors.

Because milk can in so many different ways become contaminated, it is important that all milk should be pasteurized.

Is The Capacity of the Sanatorium Adequate?

Twice since the establishment of the Onondaga Sanatorium in 1916 its capacity has been enlarged through the construction of new buildings. Its original capacity was 138 beds. Six years later the addition of the Children's Pavilion (now being used for young male adolescents and adults who are ambulatory) increased the number of beds to 168. The opening of the Infirmary in 1928 raised the capacity to 220 beds. In spite of these expansions the

Sanatorium, up to about two years ago, usually had a waiting list of 5 to 20 persons. Patients with positive sputum had at times to wait weeks and months before being received into the Sanatorium.

One of the most vital requirements in the control of this infectious plague is that a sanatorium bed should be available for each patient requiring such care.

One of the first things the present superintendent did upon his arrival on March 1, 1940, was to make a special effort to overcome this waiting list. All adult patients who could safely be discharged to their homes or elsewhere were moved out of the Sanatorium, and later, as has already been stated, most of the children then occupying the Children's Pavilion were sent back to their homes. As a result of these new policies, it became possible for the Sanatorium to accept new patients quite promptly.

In the late fall of 1941, however, the growth in applications for admission led to the re-appearance of a waiting list, and forced the Sanatorium authorities to use every available bit of space for the installation of extra beds. As a result, the end of that year found the Sanatorium with 265 patients. The continued influx of new patients has since kept the case load at approximately this point, - the highest census in its history.

Reasons for Recent and Possible Further Increases in Sanatorium Admissions

Conditions growing out of the war have undoubtedly been responsible for the recent stepping up in the number of persons seeking admission to the Onondaga Sanatorium. The recent increased reception of patients, and also the 13 per cent jump in the city's tuberculosis mortality rate during the year 1941, doubtless reflect much the same contributory conditions. The operation of some of these forces may tend to tax the capacity of this hospital still more during the next few years.

(a) The selective service medical examinations have contributed their quota of newly found cases of tuberculosis among young men. The flow from this source is likely to become even more marked as the military authorities are now examining men in higher age brackets. This does not mean any increase in the amount of active tuberculosis in the community, but merely that the cases are now being discovered.

(b) Increased employment of men and women in defense industries and in allied fields has presumably been another contributing cause of the increased admissions. Persons lacking sufficient physical stamina, and particularly those who have in the past had tuberculosis, are being tempted by the high wages to seek employment in spite of the fact that they may be in no condition to do so. When persons engage in work which is over-fatiguing, as under the stress of wartime production, old cases of tuberculosis are bound to flare up again. These potentialities of further breakdowns from tuberculosis are likely to continue as long as the present industrial tempo persists.

(c) The fact that women, especially those in the age groups where tuberculosis most frequently develops, is another ominous sign of what may be in store. Tuberculosis develops earlier in life among women than among men, and the effects of taking the homemaker away from her accustomed duties may have widely ramifying effects upon the health of all members of the home.

(d) Insufficient housing facilities, resulting in part from the demands of an expanding industrial population, as well as other changed living conditions in the community, may or may not have been a factor in augmenting the number of persons developing tuberculosis and needing hospital care. These factors need to be watched, however.

(e) The dislocation of family life, through the drafting of the men breadwinners into military service and the growing drawing of women into manufacturing and other positions, will probably make it impossible for some persons ill with tuberculosis in their own home, particularly older persons, to continue to live at home. With no one left in the home to take care of the sick person, he will often have no other recourse than to apply for sanatorium care.

(f) Later, when soldiers are mustered out of the Army as military tuberculosis casualties, they, too, will require hospitalization. Whether this care will be provided through federal hospitals, as was done for the veterans of the First World War, or whether such patients must be accommodated in civilian hospitals, remains to be determined.

(g) In certain parts of Onondaga County greater efforts have, in the last few months, been made to bring patients with positive sputum under sanatorium care and supervision. This increased vigilance should, of course, be exercised throughout the entire city and county, and the resulting effects are likely to be registered in the changing size of the Sanatorium population.

(h) The withdrawal of physicians from the local community for the purpose of entering military positions, will inevitably make serious in-roads in the amount of medical attention available for the remaining civilian population. The same principle applies, in no small measure, to the probable aftermath of cutting down the number of nurses in the community. The results of these reductions in the local professional personnel, which may continue for years, will likely mean failure to discover tuberculosis until it has reached an advanced stage and therefore needs a longer hospitalization. While no evidence exists that these factors have as yet become operative in Syracuse, it is disturbing to contemplate what may lie ahead of us.

Means of Keeping the Sanatorium Patient Load at a Minimum

In view of the foregoing facts, the citizens of Onondaga County are faced by two questions: Is the Onondaga Sanatorium likely to find its capacity seriously overtaxed? If so, what steps can and should be taken to keep the number of patients as low as is consistent with their health requirements and those of the public?

(a) One of the most important means of trying to keep the population at the Sanatorium down to a minimum is to lessen the necessity of re-admitting patients. Approximately 30 per cent of the total admissions to the Onondaga Sanatorium in any given year are re-admissions of former patients. A good share of these re-admissions are on the part of patients who have left the hospital against medical advice. When patients come back to the Sanatorium a second time, their disease is usually further advanced, and it calls for longer treatment than would otherwise have been necessary. Everything possible should, therefore, be done to hold the patients, on their original admission, until they can secure a maximum of benefit from the treatment. Highly important also is an adequate program of after-care and rehabilitation, as a means of preventing

relapses.

(b) Another possible means of releasing Sanatorium beds for new patients might be through the development of resources for the care of certain types of patients either in properly conducted private boarding homes, or in a special colony for such patients. Reference is had particularly to those patients, now in the Onondaga Sanatorium, for the most part of middle age or older, whose disease is no longer progressive, and who do not necessarily require the expensive facilities provided by the Sanatorium. Certain of these patients should not be allowed to be at large in the community; they need to be kept under suitable domiciliary and nursing supervision. Some such patients are at times kept in the Sanatorium because they have no home to which to go. This subject, too, will be discussed in the Part V.

(c) Patients accepted at the Sanatorium for observational purposes, pending a final determination as to whether their condition is tuberculous or not, should naturally be retained no longer than necessary. Those found to have non-tuberculous conditions should be transferred to some other place. These matters are already receiving the attention of the medical staff.

(d) Another means of keeping the census as low as is consistent with the medical requirements of the patients, is through the periodic review by the superintendent and his staff of the condition and requirements of all patients already in the Sanatorium. This, again, is already being done. It is mentioned at this point because it would be unfortunate if the suggestion should ever be made that, as an economy measure, the average length of stay of patients be reduced. Any such action would, in the judgment of the Committee, be ill-advised. The propper length of care can be determined only on an individual basis, and the present average would seem to be no longer than it should be. Past experience by revealing what happens to patients after they leave the Sanatorium has demonstrated the human and economic importance of giving them the full benefit of whatever length of stay will best shield them against a later breakdown with its resulting necessity of their re-admission.

(e) The use of pneumothorax and other forms of chest surgery were at first widely heralded as a means of shortening the period of treatment. This does, to be sure, constitute one of the advantages of chest surgery, and the Sanatorium has profited in this way from the use of these measures. However, it is doubtful that pneumothorax can wisely be used in a larger proportion of cases than at present.

(f) A final possibility in attacking the problem of adequate capacity at Onondaga Hill is the fullest possible utilization of hospital beds elsewhere in the State.

From what has been said it is quite clear that it is too early to express any opinion as to whether the patient capacity of the Onondaga Sanatorium will or will not have to be enlarged. The main need at present would seem to be to watch developments, and to have full confidence meanwhile that the Sanatorium authorities will do their utmost to carry out their responsibilities as efficiently as possible.

In addition to these problems centering about the housing of patients, there are also the problems of satisfactorily housing the Sanatorium staff. The Onondaga Sanatorium is one of the few hospitals of its size and kind in New York State, or for that matter in the United States, which does not provide suitable residential quarters for its medical superintendent. The Board of

Managers of the Sanatorium, and also the State Health Department, have on a number of occasions recommended that a building be erected on the Sanatorium grounds for this purpose. Better accommodations should also be provided for other staff employees. The present Committee joins in the recommendations that the construction of the needed quarters for the superintendent be undertaken as soon as it is practicable to do so.

General Hospitals

The general hospitals in Syracuse, because of the communicable nature of tuberculosis, prefer not to receive patients who are known to have this disease. Yet of the patients received into the Onondaga Sanatorium during the past year, 25 entered from 7 local general hospitals.

It is almost inevitable that general hospitals will every now and then receive patients whose all-over picture includes tuberculosis, regardless of whether its existence is recognized at the time of admission or not. This is because ward patients so frequently come from the economic and occupational groups where tuberculosis is most likely to occur.

City Hospital

To provide emergency care of tuberculous patients who cannot be admitted at once to the Onondaga Sanatorium, the City Communicable Disease Hospital, bed capacity 84, located in the Medical Center, has for the last two years been receiving such patients for a temporary period pending their transfer to the Onondaga Sanatorium.

The number of beds in the City Hospital available for this purpose varies with the season of the year. At certain times during the winter it may have no vacancies at all which can be utilized for such temporary care. During 1940, the City Hospital admitted 34 such patients, and in 1941 it took in 42. During the latter year it provided a total of 807 days of care, with an average of 19 days per tuberculosis patient.

State Tuberculosis Hospitals and State Financial Policy

Upon recommendation by the Special State Health Commission the Legislature in 1931 authorized the establishment by the State Health Department of three regional State tuberculosis sanatoria, and later it also authorized the converting of part of the State Hospital for Incipient Tuberculosis at Raybrook into a regional sanatorium receiving all forms of the disease. The new hospitals are located at Ithaca, Mount Morris, and Oneonta. Although intended primarily to serve rural counties not having a sanatoria of their own, these four state sanatoria also receive patients from other upstate counties, provided there are bed vacancies. During the past year about a dozen patients from Syracuse and Onondaga County were under care at the Biggs Memorial State Hospital, located on the west shore of Cayuga Lake about three miles from the center of Ithaca. Several of these patients went there especially because of its facilities for chest surgery.

While the maintenance cost of these four State sanatoria is met through general State taxes, the care and treatment of patients from Onondaga County in such hospitals has formerly had to be paid for either by the patients or their relatives, or, where this has been impossible, through a county

appropriation administered originally by the County Welfare Department and later by the Onondaga Sanatorium. Under a law passed by the Legislature of 1942, the care given in such hospitals will hereafter be paid for by the State, but pay may still be collected from any patient, found able to pay, at a rate to be fixed by the State commissioner of health.

What the ultimate policy of the State will be with regard to the financing of tuberculosis control in the more populous areas is for the future to determine. While Syracusans help support the present State hospital program which largely benefits other counties, the State Health Department provides no financial assistance in connection with the tuberculosis services maintained by the city of Syracuse and the County of Onondaga. (The only exceptions pertain to the State aid for the City Laboratory, and for the work of the county public health nurses in towns.) This financial problem may well be studied both by the State and by local taxpayers.

Veterans Hospitals

The United States Veterans Administration maintains a number of tuberculosis sanatoria in different parts of the country. Two such institutions are in New York State, one with a capacity of about 1,100 beds at Sun Mount, near Tupper Lake, and another of about 400 beds at Beacon in Dutchess County. Sun Mount is the one usually used for Syracuse and Onondaga County veterans. At the present time we have seven patients undergoing care there.

These Federal hospitals provide free treatment for any veteran of either the Spanish War or either World War, and for any peacetime veteran who is drawing a pension for his tuberculosis disability. Applications for admission can be made either through the local Department of Veterans Assistance or through the American Red Cross. Any physician upon diagnosing such a case of tuberculosis is authorized to fill out the required medical certificate.

The long waiting lists at these federal institutions explain in part why so many veterans are cared for at the Onondaga Sanatorium, where their treatment is paid for through the County Budget.

Private Sanatoria

There are also several private sanatoria in New York State to which some Syracuse patients go. In this connection it may be stated that in so far as treatment is concerned, the geographical location of any given sanatorium and climate are nowadays regarded as quite secondary factors. For persons having tuberculosis, to journey to distant parts of the country for treatment is unnecessary, and, as a rule, unwise. Ordinarily speaking, the climate of Onondaga County is just as favorable for the care of persons having pulmonary tuberculosis as that found anywhere else.

Possible Future Uses of the Onondaga Sanatorium

The query may arise as to what use will be found for the Onondaga Sanatorium plant if and when the amount of tuberculosis in this county becomes so reduced as to make a special hospital for tuberculosis patients no longer necessary. While it is difficult to anticipate all that may develop, the material reduction or eradication of tuberculosis would still leave ample and

important uses for the hospital at Onondaga Hill.

It is a well-known fact that Syracuse has a shortage in hospital beds. While tuberculosis has in recent years been declining, heart disease, arthritis, and certain other chronic diseases which occur particularly among middle-aged and old persons, have increased. Many of these chronic patients require relatively little medical treatment, and the presence of such patients in general hospitals often makes it impossible for such hospitals to receive persons who are suffering from more acute conditions. What is chiefly required by many of these chronic patients is moderately-priced or free hospital care, with a minimum of medical attention, but plenty of nursing supervision.

In 1927 the local medical societies and other agencies petitioned the County Board of Supervisors to erect a hospital building for patients with chronic diseases, on the Sanatorium grounds, and to place the said hospital under the administration of the Sanatorium.

When the number of tuberculosis patients at the Onondaga Sanatorium eventually becomes sufficiently reduced, the resulting vacancies can advantageously be used by these other types of chronic patients.

Treatment of Tuberculosis Through the Chest Clinic

In addition to serving as an examination center for the discovery of new cases of tuberculosis, the Chest Clinic, conducted by the City Department of Health in the rear of the Free Dispensary building at 610 East Fayette Street, renders important services in connection with the treatment of ambulatory patients. It provides medical supervision for three groups of tuberculous persons: those needing to be looked after pending their admission to the Sanatorium; those who have left the Sanatorium and require medical follow-up, and those who do not go to the Sanatorium but remain at home.

During the year 1941 the Chest Clinic gave medical supervision to a total of 141 patients whose disease had been diagnosed that year. Of these, 61 had pulmonary tuberculosis in a minimal stage, 33 in a moderately advanced stage, and 37 in a far advanced stage, and 10 had other forms of tuberculosis. The Clinic was also looking after 300 patients who had originally come under its oversight in previous years.

While the Clinic is willing to examine any local resident to learn whether he has tuberculosis, it is the policy of the Clinic to treat only those patients who are unable to employ their own physician. Practically the only exceptions to this rule are where patients under a private physician are accepted either for consultation purposes or for pneumothorax, provided such a step is recommended by the patient's own doctor.

The frequency of the visits to the Tuberculosis Clinic by the patients under its medical supervision varies according to the circumstances of the case, some having to go there once or twice a month, and others not oftener than once in every three to six months.

Besides checking up on the physical condition of the patients, the Clinic physicians give advice as to the proper management of the person's disease, and prescribe medicine or other special measures as may be required. The medical prescriptions are dispensed by the pharmacy conducted as part of the Dispensary. Whenever in the course of the handling of a case of any given

individual, it becomes important that the person enter the Sanatorium, the Clinic tries to persuade the person to go to the Sanatorium.

Pneumothorax refills are administered at each Clinic session. During the past year there were 535 such treatments given to 25 patients. Each person receiving pneumothorax is fluoroscoped before the air is injected. Several of these patients are employed, and it would be impossible for them to hold their positions were it not for the existence of this method of treating and controlling their disease.

Services of Public Health Nurses in Connection with Treatment

No more important arm of the local tuberculosis service exists than the work carried on by the public health nurses employed in the Nursing Bureau of the City Health Department. In addition to their responsibilities in connection with tuberculosis case-finding and case-control, previously described, they perform essential duties in connection with the treatment of tuberculosis patients. They work under the joint control of the Tuberculosis Bureau and the Nursing Bureau, and are, in effect, the field personnel of the Tuberculosis Bureau and Clinic.

Some of the patients under their supervision are those awaiting admission to the Sanatorium. Others need to be followed up after they leave the Sanatorium. This after-care work has already been referred to in Part III. on Case-Control. Still other patients, for one reason or another, are never hospitalized. In some instances the public health nursing supervision has to continue for years.

One of the main functions of the nurses is to assist the Clinic physicians in trying to induce patients to enter the Sanatorium when the circumstances of the case call for this step. It often requires great tact and skill on the part of the nurse to persuade not only the patient, but also other members of the family, that Sanatorium care is imperative. In trying to promote Clinic attendance and the periodic medical re-examination of patients much resourcefulness and diplomatic persistence is again called for. Particularly is this true when so many patients fail to realize the importance of the X-ray and other types of examination which they should receive.

Another important feature of public health nursing is its education concerning the patient's health conduct and concerning proper cooperation on the part of the family. In cases where the tuberculosis patients live at home, the nurse serving the district must furnish instructions and make practical demonstrations concerning dozens of details. These include, for example, instruction concerning the disposal of sputum and other means of preventing the spread of the infection. Both the patient and other members of the household usually have to be instructed with regard to desirable sleeping arrangements, housekeeping methods, and proper nutrition. The only way to teach some of these phases of personal hygiene and case management is by concrete demonstrations by the nurse. Highly important also is the education which she gives concerning the needed restriction of the patient's physical activities and his securing of an abundance of rest.

Still another valuable function carried out by these public health nurses is to build up and maintain right mental attitudes, on the part of both the patient and his family, toward this long-term communicable disease. She must also help solve miscellaneous personal and social difficulties. In this

connection she at times has to enlist the cooperation of social or other community agencies.

The nurses employed in the Nursing Bureau stand ready at all times to be of service to private physicians in connection with any of the tuberculosis patients who are under their private medical care, provided the doctor requests any of the foregoing kinds of assistance.

Tuberculosis patients who live at home and are confined to their bed and require bedside nursing, can receive this type of nursing care through the Visiting Nurse Association. During the year 1941 that Association made 164 home visits to 14 such patients.

Treatment Through Private Physicians

Persons having tuberculosis not infrequently prefer to have their diseased condition looked after by their own private physician. The number of persons with active pulmonary tuberculosis who were reported at the end of the year 1941 as depending for their treatment wholly upon private practitioners, totalled 62. It has been found, however, that some of those said to be under the care of their own physician go to him only at very infrequent intervals. In some cases, too, the patient goes to one physician for a while, and later changes to one or more other physicians. This naturally makes the needed continuity of treatment difficult.

It is possible, of course, for persons with tuberculosis to be satisfactorily treated by private physicians, provided the right combination of circumstances exists. Much depends upon the stage of the disease, the home environment, the family's economic resources and other factors.

The requirements concerning the treatment of tuberculosis are the same, regardless of the channel through which the treatment may be furnished. The importance of a continuing medical re-checking of the patient's condition, periodic chest X-rays, close surveillance and control over the patient's rest regime, chest surgery in such cases as it may be called for, carefully kept clinical records, occupational therapy and such other rehabilitation measures as may be desirable, - all these are equally vital whether the patient is in a hospital or in his own home. The relative importance of these and other facilities and services depends, in any given case, wholly upon its individual circumstances.

The competent doctor can judge where it is best for the patient to be. In growing numbers of cases, tuberculosis patients throughout the United States are first being hospitalized in a sanatorium, and then later being looked after by their own physician.

When patients are under the care of a private practitioner the latter can be greatly aided by having a public health nurse visit them, both to check on their surroundings and the observance of the doctor's orders, and to give supplementary instructions, regarding their health conduct and the avoidance of the spread of their infection. Of the 62 patients who were under the care of private physicians at the end of last December, 37 were also receiving the benefits of public health nursing supervision.

City Physicians

When patients under the supervision of the Chest Clinic, or any other tuberculous patients living in Syracuse and unable to employ their own doctor, become confined to their home whether on account of tuberculosis or any other illness, they are entitled to receive free home medical attention by calling in one of the district physicians employed for this purpose by the County Welfare Department.

After-Care

It cannot be stressed too strongly that the hospital care of tuberculosis patients is only one stage of the treatment, and that Sanatorium care needs to be followed by a long period of after-care. In reality, after-care is a part of the treatment itself.

After-care may be defined as a watchful supervision of the tuberculous patient's physical condition, together with such occasional or continuing medical aid as circumstances may require, following his active medical treatment. The term is applied more especially to such measures as are furnished after the disease has become inactive and apparently or fully arrested. Its object is to contribute to the further improvement of the patient's physical well-being, and to fortify him against a relapse.

Certain aspects of after-care have already been discussed in Part III. on Case-Control, as well as in some of the earlier sections of Part IV. on Treatment. Summarizing what has already been said, the four main services supplied through after-care are the following:

Public health nursing supervision for the purpose of keeping informed about the patient's whereabouts, living conditions, and health behavior.

Periodic medical re-examinations, including X-ray examinations.

Health counseling, with special reference to healthful living and the avoidance of over-exertion and fatigue.

Such medical treatment as may at times be required, including prompt care of a cold or any other debilitating illness.

Recommendations

15 - Under present wartime conditions with so many physicians and nurses being called away because of military demands, it is particularly important that every effort be made, by both the city and the county authorities to maintain adequate and competent professional staffs. It is likewise important that necessary expenditures for food and other essentials at the Sanatorium be kept up. Unwise curtailments in these regards might easily prove disastrous and a false economy.

16 - All persons residing in Onondaga County who have active tuberculosis should receive free care and treatment at the Onondaga County Sanatorium.

17 - When suitable arrangements with the Syracuse University College of Medicine can be worked out, local facilities for chest surgery should be expanded.

PART V. - REHABILITATION

Nature and Purpose of Rehabilitation

Rehabilitation differs from after-care in that it primarily concerns not the patient's physical disease, but his psychological, social, economic, educational, and vocational status and needs. It looks upon the patient not as a pair of lungs, but as a personality having social and economic relationships. Looking forward to the time when his physical condition will be sufficiently improved to permit the re-assumption of his place in family and community life, it aims to help him, when that time comes, to live as fully, as efficiently, and as happily as possible. Its object is to strengthen his morale, promote social readjustments, and restore his vocational and earning abilities.

Importance of Community Programs of After-Care and Rehabilitation

No program for the control and eradication of tuberculosis can be fully successful unless it includes properly implemented provisions for both after-care and rehabilitation. Such provisions are needed not only for the conservation and advancement of the patient's individual health and welfare, but also for the protection of the community against the costly results of relapses.

The importance of after-care and rehabilitation is emphasized by the numbers of tuberculous patients who, after leaving the Sanatorium, fail to make the necessary social and vocational adjustments, and who as a result experience a re-activation of their disease, necessitating their re-admission to sanatorium care. Just a few weeks of improper living conditions after leaving the Sanatorium, or of unsuitable employment, may undo the effects of months or even years of expensive treatment. In comparison with the costs which follow a breakdown, the cost of after-care and rehabilitation is small.

Tuberculosis more than almost any other physical disease unfits its victims for normal and successful living as members of socity, unless proper rehabilitation measures are carried out. The handicaps from which the tuberculosis patient suffers are not physical alone. When the information is first conveyed to a person that he has active tuberculosis, the news generally produces a shock. He visualizes a long period of incapacitation ahead of him, loss of his job, the temporary or permanent disruption of family ties, the thwarting of desires and ambitions. He easily becomes beset by sensitiveness and fears. His enforced physical inactivity usually includes for a considerable time a necessary let-up also in his mental activity as well. The breaking down of his work habits, his loss of economic independence, and the dislocation of his customary family and social relationships, - all these color his emotional attitudes and spirit.

Everything possible should therefore be done to sustain his morale and help him cope with his various social and other problems. If his disease is in a stage where there is ground or hope of its becoming arrested, he will generally need assistance in eventually re-establishing himself as a member of the community, and in finding suitable occupation. He may require educational and vocational guidance, special training, and aid in finding the right job. Because each patient is different, no cut-and-dried patterns can be followed. The rehabilitation methods used must be based on a thorough understanding of him as an

individual, and of his special needs.

After-care and rehabilitation are complementary, and the efforts in these two fields must therefore be kept correlated. Whatever is done for his vocational and other rehabilitation ought always to take account of his physical status and requirements. While after-care does not begin until after the patient has left the hospital, certain phases of rehabilitation, as will presently be explained, should start as soon as possible after the patient enters the hospital.

The most complicated and difficult of these problems are those relating to rehabilitation. While commendable beginnings have been made in several sectors of this latter field, the local rehabilitation program needs to be broadened and intensified.

Medical Control of Rehabilitation

The success of rehabilitation depends, in final analysis, upon the physician in charge of the patient. This is because the planning must at all times be kept under medical control.

The attitude of the physician of today is very different from that of the physician of years ago whose only thought was to improve the patient's physical condition. The physician nowadays sees the patient as a whole, - not just as a body having certain parts diseased, but as a many-sided personality. Hence the members of the medical staff of the Onondaga Sanatorium are not satisfied merely to regulate and restrict the physical activities of the patients, month after month, in order to facilitate maximum healing of the diseased lung tissues. They realize the importance, too, of their social and economic restoration. In other words, the Sanatorium physician must be "a social doctor."

The statement that rehabilitation must be kept under medical control means that whatever is done by the patient as a participant in his rehabilitation, - or by anyone else - whether through occupational therapy, education, or what not, - should be on a prescription basis. The fact that a Sanatorium doctor recommends occupational therapy or an educational program makes the patient that much more appreciative of the fact that these measures have therapeutic value. It makes him realize all the more keenly that such measures are an integral part of his total treatment.

Patient Morale

Nothing causes more boredom and discouragement than to lie interminably in bed - with nothing to do. Unhappiness and depression on the patient's part cannot help but lower his vitality, and retard his progress. For these reasons the Onondaga Sanatorium has always recognized the importance of keeping the surroundings of its patients as cheerful as possible. This applies not only to physical environment and such things as menus; equally vital is the total atmosphere of the place and a spirit of friendliness and optimism on the part of the staff. Not a few persons when asked what they would do if compelled to face the ordeal of having to keep to one's bed for months have answered, "I'd go crazy." Such things, for example, as the radio by the bedside and the Sanatorium library help to keep up mental contacts with the outside world, and to prevent depression and mental breakdowns.

One of the helpful means of promoting morale in the Onondaga Sanatorium has been the work of its Women's Auxiliary. Its friendly services in behalf of the patients down through the years have been numerous. There is also a Junior Auxiliary, which devotes its energies more especially to the children and the out-patient department. One of its latest services has been the providing of recreational programs.

Occupational Therapy

The services of an occupational therapist have been provided at the Sanatorium since 1921. Certain patients, with the approval of a staff physician, receive instruction and working materials from the occupational therapist at their bedside. Ambulatory patients are allowed to go to the occupational therapy workshop located in the basement of the Infirmary Building. During the year 1941 the patients carrying on such activities in their rooms numbered 125, and those using the workshop numbered 40. The most popular crafts include such activities as knitting, wood carving, embroidery, weaving, making hooked rugs, metal work, and the like.

The purposes of the occupational therapy are (a) diversional and morale-building, (b) therapeutic, and (c) vocational and economic. Regardless of which of these aims may be uppermost, the activities are carried on only upon a medical prescription basis, suited to the capacity and needs of the individual patient.

Because of the importance of giving patients "something to do," occupational therapy often offers one of the most buoying influences a sick person can experience.

Occupational therapy also helps to prepare the patient mentally for his reassumption of community life. His medical regime in the Sanatorium requires that he lay aside his former work habits, and for the time being become as lazy as possible. Only as his physical condition improves, can he gradually build up new work habits. Many patients become over afraid, lest even the slightest exercise on their part may lead to another physical breakdown. Occupational therapy serves to overcome wrong attitudes in these regards by reconditioning the patient psychologically.

Occupational therapy also provides an excellent means of "hardening" the patient physically and of testing his work tolerance. It helps to condition him for whatever vocational training he may need, and also for later employment. In addition to the more formal handicrafts ordinarily included under the heading of occupational therapy, certain patients in the Sanatorium are permitted to do minor chores about the hospital, such as delivering papers, helping on the telephone switchboard, taking care of the radio, and working in the library. A graduated program of work activities for sanatorium patients helps to cut down relapses and re-admissions in later years. Such activities as these just mentioned also aid in re-establishing habits of responsibility and regular performance.

Finally, the occupational therapy instruction and opportunities assist, at times, in developing skills which may later have vocational worthwhileness, and enable some of the patients to earn money.

Some local discussion has been carried on in the past concerning the feasibility of starting a community occupational therapy workshop in Syracuse to be used by physically handicapped persons living in their own homes. Not

only ambulatory tuberculosis patients, but also persons convalescing from operations and those handicapped by orthopedic defects, by heart disease, and by other illnesses, might advantageously use such facilities.

The community occupational therapy workshops found in certain cities are of two types. One kind is for persons who need such facilities for a relatively short time, primarily for their diversional and therapeutic benefits. The second kind provides sheltered remunerative employment for persons who are permanently handicapped and who cannot otherwise find work.

When a committee of the Syracuse Council of Social Agencies Health Division inquired into this subject some years ago, it was estimated that were such a workshop to be started, perhaps as many as 30 tuberculosis patients, most of them graduates of the Sanatorium, might perhaps wish to avail themselves of the opportunities thus offered. The problem of admitting tuberculosis patients into such a shop would call for careful planning to shield other types of patients from possible infection. This problem is differently met in different communities.

Social Case Work

One of the most important elements in successfully dealing with tuberculosis patients consists of the study and skilful handling of their social and personality problems. A large proportion of the patients in every sanatorium come from a background of economic insufficiency, poor housing, and unfavorable living standards, which has in many cases been contributory to the development of their disease. Worries over finances and other family situations, as well as various other social and emotional factors often seriously hamper the patient's medical progress. They stand in the way, too, of his successful rehabilitation and restoration to society. The unsolved problems of these kinds not infrequently so undermine the benefits of the Sanatorium treatment, as to render the investment which it represents an almost complete loss.

Various public and private social agencies render a variety of valuable services in behalf of many of the Sanatorium patients and their families. These services do not, however, cover the needs adequately.

The Sanatorium population is sufficiently large to warrant the employment of some one on its staff who can give full time to keeping close to these highly individualized non-medical problems, trying to analyze the situations as they develop, and then bringing into play the social work measures which the particular personality or the social disabilities of each patient seem to call for. A large proportion of the patients - perhaps as many as three-quarters of them - could probably derive benefits from the services of a qualified worker especially employed to deal with these problems. It would be necessary that the worker, in addition to possessing the requisite professional training and a special adaptability for these duties, must also understand tuberculosis.

The functions of such a person are quite different from those performed by nurses or any of the other personnel now on the Sanatorium staff.

The employment of trained persons to handle these medico-social work problems has been recommended by the National Tuberculosis Association, the New York State Health Commission of 1930, Dr. C.-E. A. Winslow of Yale Medical

College who conducted the Syracuse survey, and certain local organizations. Many sanatoria throughout the United States now employ these useful aids as essential cogs in their treatment and rehabilitation programs.

A properly trained and qualified worker of this kind should be able to save many times the amount of her salary, particularly through enlisting patient and family cooperation and through preventing discharges against medical advice. Inasmuch as so many professional workers are today being drawn into military work it might be difficult, however, to find a suitable person for these delicate duties at the present time.

Relief as a Rehabilitation Factor

The close connections between low economic standards of living, and tuberculosis, have long been recognized. Financial difficulties at home while the patient is in the Sanatorium often seriously interfere with the successful carrying out of treatment. Similarly, after the patient goes home, his ability to remain well may again depend upon the adequacy of his income. In other words, relief constitutes an extremely important instrumentality not alone in connection with the prevention of the disease, but also in connection with its treatment and with the restoration of patients to community life.

When the New York Association for Improving the Condition of the Poor made an intensive study in 1931 of the adequacy of relief among 1,288 Syracuse families in which tuberculosis was present, nearly one-quarter of these families were found to require material assistance in order to maintain even a minimum standard of proper living. Yet only 211 of the families had actually received relief during the year covered by the study, and in 150 of these cases the aid failed to cover the needs. Eighty families that required financial help were receiving no charitable assistance whatever.

The recommendations made at that time included the following: That relief-giving where there is tuberculosis in the family should be administered on a budget basis adapted to the requirements of the particular family. That the special nutritional requirements of such families call for a larger budget than would otherwise be necessary. That the relief should be dispensed not sporadically, as an emergency measure to meet some acute situation, but as a carefully-planned, long-range means of grappling with a chronic disease which develops slowly and usually persists for years. That the relief should be accompanied, as a rule, by social case work. That while relief is costly to the public, the withholding of it is likely to prove even more costly.

Great improvements have been made in the local administration of relief since that study was made. The relief now furnished through the County Welfare Department and other agencies in tuberculosis cases, is believed to be, in practically all cases, adequate. This is assuming that the importance of the relief as an essential health-protective measure has been clearly demonstrated. There is no reason at present why any family requiring this form of assistance in Syracuse or Onondaga County cannot receive it.

Reference has already been made (page 7) to the recent study of the expenditures by the County Welfare Department, and also by the Veterans Relief Bureau, during 1941, rendered necessary on account of tuberculosis on the part of Syracusans. Those so aided through the Welfare Department numbered 79, and those through the Veterans Relief Bureau, 15. The number of families receiving

such relief was considerably less than half the number of families, with tuberculosis, receiving aid during 1931. Undoubtedly, this is, at least in part, a reflection of the diminution of tuberculosis in the community. The recent review of cases brought out, very strikingly, that adequate relief is an extremely important factor in maintaining living conditions in tuberculous families on a proper level.

Under the law relating to aid to dependent children, families with one or more children under 16 years of age are entitled to receive this form of assistance on the ground that the father is under hospital care on account of tuberculosis. In some instances the mother feels less embarrassed in applying for this form of aid than for the ordinary straight relief. Furthermore, the budget allowances under this category are somewhat more liberal than in the case of other relief families.

Because the families under the Welfare Department having tuberculosis present such complicated problems, its medical director began about three years ago to hold conferences of representatives from the various agencies interested in such cases. These conferences have proved so helpful that they are now being continued at monthly intervals. In addition to promoting the exchange of information among the agencies, the meetings facilitate cooperative and improved planning with regard to both medical and social problems. One fact which has been distinctly brought out is that when a relief agency and a health agency are dealing with the same family, each should know what the other is doing for the family.

Former Rehabilitation Committee

In 1932 a Rehabilitation Committee was created to review the cases of certain Sanatorium patients whose disease had become apparently or fully arrested, or was likely to become so, and who needed guidance and assistance in planning for their return home or their possible re-employment. This Committee, composed of representatives from eight to ten health, social, and educational agencies, met monthly to advise on the many-sided problems which such patients presented. The recommendations resulting from the work of this Committee were passed on to the Sanatorium authorities, who then had the responsibility of determining when the patients should be discharged and what should be done to promote their future interests. The recommendations were also made available to the Nursing Bureau which usually followed up such patients after their return home.

The after-care and rehabilitation problems of the patients were usually varied and highly individualized, and consideration had to be given to a wide range of facts and circumstances. In addition to the strictly medical phases, these included the patient's social and economic background, his intelligence level, schooling, previous vocations, present interests and ambitions, and various personality and other factors. One fundamental principle which the Committee's experience brought into clear relief was that this type of social and educational inquiry and planning must be started early, - the sooner after the patient's admission to the Sanatorium the better.

The responsibility for studying these matters was transferred in the fall of 1939 to the Sanatorium staff, since it was felt that it was there that the responsibility most appropriately belonged. The Sanatorium physicians, the head nurse, the field nurse, the occupational therapist, the educational director, and others on the hospital staff are, as a rule, in the most favorable

position to study the patients and pool their judgments as to their needs. The way is of course still left open for the Sanatorium authorities to obtain from various outside sources such supplementary information and recommendations in the various cases as may be desirable.

State Rehabilitation Bureau

For a number of years the Sanatorium has received active and valued cooperation from the Syracuse office of the State Rehabilitation Bureau. This Bureau is administered by the State Education Department as part of the nation-wide program for the rehabilitation of physically handicapped persons.

A physically handicapped person is one, who, by reason of his defect or infirmity, is, or may be expected to be, handicapped or incapacitated with regard to securing employment. Only those persons are accepted for assistance by the Rehabilitation Bureau who are capable of rehabilitation. The Bureau does not assist persons if they are to return to their former occupations, but accepts only those who need special training to prepare them for some new form of employment. The training must be adapted to the applicant's mental and physical capacities, and must also take account of the likelihood of his being able to secure employment in the new occupation.

Persons who have been under treatment for pulmonary tuberculosis are accepted by this Bureau only when a tuberculosis specialist certifies in writing that the disease is in an arrested condition, that the person is able to take full-time training under normal conditions, and that after being prepared for a suitable occupation he can work eight hours a day. These further conditions are also to be complied with: that he shall have been under close medical supervision, that he shall have been periodically and recently X-rayed, and that he shall have been free from all symptoms and clinical signs of the disease for a period of six months, followed by another six months of medically declared arrest. The disease must not only have become inactive; it must also have reached a stage of dependable stability. In other words, the patient must have become properly "hardened."

It is customary to employ various psychological tests in determining the intelligence and other mental traits of the prospective trainees. On the basis of the interviews with the patient and the psychological testing, the Bureau next counsels with him as to the range of employments for which he seems best adapted. After accepting the applicant, the Rehabilitation Bureau then finances the person's training in shop work, in office work, or in whatever other field that may be recommended. In addition to providing the training, the State Rehabilitation Bureau, when necessary, also furnishes living expenses for the trainee during his training period. Upon the conclusion of the course of training, the Bureau helps in finding the trainee a suitable position. Those receiving the training are kept under supervision for at least one year after their entrance into employment, and not a few of them may be followed for as long as five years.

The extent to which the local Bureau of Vocational Rehabilitation has assisted the Onondaga Sanatorium in these ways is indicated by the following statistics:

Year Beginning July 1	Tuberculosis Trainees who Completed Their Training
1935	3
1936	5
1937	6
1938	8
1939	9
1940	6
1941	4

The cost of these rehabilitation services, met from combined State and federal funds, has averaged $525 per trainee.

Present Re-Education Program at the Sanatorium

It has long been customary to refer to tuberculosis sanatoria as educational institutions, in the sense that they give their patients needed medical counselling and health education for combating their disease. In more recent years and under the stimulus of the National Tuberculosis Association, a growing number of sanatoria in different parts of the country have become educational institutions in still another sense, namely, in supplying their patients with needed academic and vocational education. They are educating their patients not only to keep well, but to "make good" after they leave the sanatorium.

The proportion of patients in the Onondaga Sanatorium, who are eligible for the benefits of the educational and vocational parts of the local rehabilitation program, depends upon the condition and individual needs of those who happen to be there at any given time. The earlier the stage of the disease, the more likely they are to be able to profit from such measures.

Studies in different parts of the country have indicated that perhaps as many as half of the patients discharged from sanatoria can usually return to their former ways of living. Of these, about 10 per cent of the total number discharged can usually go back to their old job, about 10 per cent return to their duties as homemakers, about 10 per cent are capable of working out their own plans for their future, about 10 per cent are either too young or too old to be suitable for vocational placement, and about 10 per cent are eligible for vocational rehabilitation under the Federal and State rehabilitation programs. About one half of the patients in the local Sanatorium are generally able to profit from one or another phase of its educational and rehabilitation program. Most of them are suitable for psychological testing, and many of them for vocational assistance.

The present educational program at the Onondaga Sanatorium has been the outgrowth of a number of preliminary steps. The first step was the securing of the services of two teachers to teach grammar school subjects to the boys and girls in the former Children's Pavilion. Their assignment to these duties continued until this building was no longer required for children.

In 1931 the Onondaga Health Association furnished the services of a trained educator to conduct an educational survey at the Sanatorium. She interviewed 127 patients upward of 16 years of age, and 79 of them expressed a desire to undertake one or another form of systematic study. The medical superintendent gave his approval to letting 52 of them receive the forms of instruction

they desired. All told, they asked to be taught 17 different subjects. The subjects most frequently requested were shorthand and typewriting, English and spelling, and radio work. Unfortunately the Sanatorium could not at that time secure the means of providing the requested teaching services.

A second survey was made at the Sanatorium in 1937 by a psychometrist and rehabilitation worker from the National Tuberculosis Association. During the week of her stay in Syracuse she carefully studied the mentality and the educational and vocational needs of a sample group of 16 adult patients. The information thus brought together, and the recommendations growing out of her inquiries, served as an excellent demonstration of the practical value of psychological tests when properly chosen and conducted. She also made constructive recommendations for an educational and guidance program.

For a number of years the Americanization League conducted Americanization education among the adult patients at the Sanatorium. This service was later taken over as a Federal Emergency Adult Education project, with three teachers conducting the classes. The program was supervised by the Syracuse Department of Public Instruction. The subjects taught included English, shorthand, typing, civics, algebra, geometry, dramatics, American history, European history, arithmetic, psychology, bookkeeping, and sewing.

The County Budget adopted in 1940 created the position of educational director at the Sanatorium, and a trained educator especially interested in work in behalf of physically handicapped persons was appointed to the position. He is assisted by two qualified teachers paid from County funds. For a while he also had five W.P.A. teachers working under his supervision, but their services have lately been withdrawn. During the year 1941 a total of 141 adult patients, 104 of them over 20 years of age, received instruction in various elementary, Americanization, high school, commercial, and industrial subjects. In some of the subjects, Regents' examinations were given.

The educational director also gives psychological tests to many of the patients. These include both psychometric measurements of intelligence, and tests concerning vocational aptitudes. The information and insight so gained, as well as that obtained through other means at his command, is used in counselling the patients. Meanwhile the educational director still continues to refer patients to the State Rehabilitation Bureau when he deems them eligible for special training.

A foundation has thus been laid for an expanded educational program comparable with those found in certain other sanatoria. The work in these directions should be encouraged and extended. Possible additional courses leading to possible vocational openings, might relate to such subjects as wood work, printing, etching, book-binding, drafting, optical work, and photography. Inasmuch as about half of the women patients in the Sanatorium are homemakers, it would be particularly valuable if more extensive facilities could also be provided for their instruction in domestic cooking, the selection of food, sewing, and kindred subjects.

Placement in Employment

One of the most critical moments in the career of anyone having tuberculosis arrives when he tries to go back to work. A main consideration has to be that the form of work selected will not cause over-fatigue. Wrong placement can easily result in the undoing of months or years of treatment, and thereby

nullify the benefits of the sizeable investment which the patient's treatment represents. In some cases the wisest course may be for him to accept part-time work, until he makes sure that he can safely fill a full-time position. Too often, the person whose tuberculosis has become arrested has the notion that what he should do is outdoor work where he can get plenty of air; it so happens, however, that outdoor jobs usually make over-heavy demands upon the patient's strength. Indoor semi-sedentary occupations are much less likely to entail health risks.

In November, 1939, the Syracuse branch of the New York State Employment Office appointed a special placement agent for physically handicapped persons. Up to January 1, 1942, when this activity was taken over as part of the U. S. Employment Service, those for whom he obtained positions included approximately a dozen persons with arrested tuberculosis. In making such placements, a special effort is made to choose a type of work suitable and safe for the particular individual. In this connection the information and recommendations furnished by the physicians and the educational director at the Sanatorium are found especially valuable.

Employer Attitudes and Compensation Insurance

Employers are at the present time considerably more willing than they used to be to hire ex-tuberculosis patients, provided they can receive assurance that it is safe for them to do so. Many large corporations in the United States make it one of their regular policies to take back former tuberculous workers who have been "cured." Large numbers of graduates from the Onondaga Sanatorium have been successfully restored to employment in local industrial and business positions.

What is needed in this connection is the application of the "rule of reason." Persons likely to break down or to spread their infection should naturally be refused employment. On the other hand, experience has shown that when a person whose tuberculosis has been medically pronounced as arrested or cured, engages in an occupation which does not overtax his energies, and when the person faithfully submits to medical follow-ups at proper intervals, there is usually little risk either to the worker himself or to others. Employers are more and more recognizing that those who have been properly trained with regard to needed health precautions are, in fact, much less likely to spread infection to their fellows than are workers hired at random, about whose medical condition the employer is ignorant. In spite of the fact that these latter workers may show no actual symptoms, they may, nevertheless, be disseminators of tuberculosis germs.

Under the compensation laws pulmonary tuberculosis, as has already been pointed out, is not an occupational disease. Only rarely can work conditions or an injury received in connection with the job be proved to have aggravated any pre-existent tuberculosis condition, thereby constituting a basis for collecting compensation. The only exception relates to the work of employes in hospitals which involves an exposure to the infection over and above that ordinarily met with.

Boarding Homes and Colony Care for Chronic Patients

The Onondaga Sanatorium, like every other hospital of its kind, cares for a considerable number of patients whose disease has become of such a

chronic nature that it can never be cured, but who are nevertheless able to be up and about, and who can often perform a fair amount of light work. Their sputum may be either negative or positive; even when negative there is still the chance, however, as has already been explained, that subsequent laboratory reports may show the person has again become infectious.

These persons - there are usually from 10 to 20 of these older chronic patients in the Sanatorium, chiefly men, - are not suitable candidates for rehabilitation. It would be neither wise nor safe to let them go home from the Sanatorium; in fact, many of them are homeless. Although the problems they present are mainly those of treatment or more especially of after-care, this seems a logical place for the present Report to discuss their needs.

The patients to whom reference is made do not require the expensive care and treatment provided at the Sanatorium. They would be just as well off, and it would be less expensive for the public, if they could be housed and looked after elsewhere than in the present buildings at the Sanatorium. Some of these chronic patients often have a bad effect, too, upon the morale of other patients. What they chiefly need is a comfortable place in which to live where they will not be likely to spread their infection, and where they can receive such limited amount of nursing oversight as they need, as well as an occasional medical check-up.

The problems presented by this class of patients have been discussed by local physicians and health workers on a number of occasions. Three possible methods of meeting such situations have been suggested:

(a) One suggestion has been to provide a special pavilion for such patients on the Sanatorium grounds.

(b) A second suggestion has been that a special colony for these chronic patients be established somewhere else, under either public or private auspices. The only place of this character in New York State at the present time is an endowed colony in Columbia County, known as the Potts Memorial. Were another such colony ever to be created, it should preferably serve a fairly extensive territory.

(c) A third proposal has been the inauguration of a plan of private boarding home care. The house or houses thus used ought not to be too far from the Sanatorium, as proximity to the hospital at Onondaga Hill would facilitate the needed medical oversight. Precedents for such a scheme are found both in New York State and in other states. Already this method is being used in Onondaga County in isolated cases.

A practical arrangement, were the scheme to be undertaken on an organized scale, would probably be to enlist the cooperation of a number of different agencies. The home or homes should preferably be run by a nurse possessing the right personality for dealing with these kinds of boarders. In some places the local welfare department pays the board of those patients who are dependent, as is likely to be the case with most of them. Either this department or some other agency is usually responsible for such social investigations as may be required. Were such a plan to be started in Onondaga County, the Sanatorium could provide the medical supervision, and the city and county public health nurses could be looked to for the needed nursing supervision of the patients.

In some places where this mode of dealing with the problem has been

put into operation, it has been found that certain patients whose tuberculosis has been arrested and who are employed, may request the privilege of being accepted as paying boarders. There should be no objection to this, provided the location is not too inaccessible from their place of employment.

One of the responsibilities involved in any such boarding homes plan is that of protecting the public from the possible spread of the disease. Those living under such a plan want to feel reasonably free to go and come. Obviously, this necessitates a careful selection of patients as boarders, and proper check-ups on their sputum status. Their right to remain in the boarding home would have to be conditioned upon their cooperation.

There would seem to be no insurmountable obstacles to the successful administration of such a boarding home plan. Particularly would this be true if the Sanatorium or other public health authorities would exercise their legal power of instituting court actions, as recommended in an earlier part of this Report, for the restraint or compulsory hospitalization of negligent or refractory patients, should such a step become necessary.

One of the benefits accruing from the removal of these chronic patients from the Sanatorium would be that it would relieve the present congestion in the Sanatorium, and thereby make it easier to provide beds for new patients, who are more urgently in need of the Sanatorium care.

Continuing Study of Rehabilitation Problems

Rehabilitation considerably more than some of the other features of tuberculosis work, needs continuing study. Not only questions of policy and method, but possible new developments will undoubtedly require to be looked into from time to time.

One of the recommendations made by the rehabilitation director of the National Tuberculosis Association, who conferred with the health workers in Syracuse concerning these problems not long ago, was that a committee of the Onondaga Health Association give continuing attention to the local rehabilitation policies and needs.

This does not mean a committee to deal with cases of individual patients; that is the function of the Sanatorium. What is meant is rather a conference group for the study and promotion of the rehabilitation program as a whole. The field of interest covered by such a committee would pertain not only to the activities carried on at the Sanatorium itself, but also to the services and inter-relationships of other agencies and groups.

Recommendations

18 - The development of a stronger local program of social and educational rehabilitation for Sanatorium and other tuberculous patients, who may be expected to resume their place in community life, is a major need. While such a program should be a cooperative one, the largest share of this responsibility rests upon the Sanatorium. County funds should be provided for this purpose.

19 - The superintendent of the Sanatorium should appoint a rehabilitation case committee, of which he should be the chairman. This committee should study the needs of all patients who are believed to be eligible for rehabilitation,

such study and planning to start as soon as practicable after their admission to the Sanatorium, and to continue until they are ready for discharge. Encouragement should be given to the further development of the program already started at the Sanatorium for the re-education of patients. The necessary trained personnel should, as early as practicable, also be made available for studying and dealing with the personality and social problems of patients. The training facilities open to patients through the State Rehabilitation Bureau, as well as all available community resources, should continue to be used as extensively as possible. Because an all-round rehabilitation program involves so many agencies and interests, the Onondaga Health Association should give continuing study to the total rehabilitation program.

20 - Consideration should be given to the inauguration of a plan for boarding home care of properly selected chronic tuberculosis patients having positive, or potentially positive, sputum, who do not require to be kept in the Sanatorium, but who should have the supervision and friendly assistance which such a plan would provide.

PART VI. - HEALTH EDUCATION

Dependence of Health Conduct Upon Health Knowledge

The ways in which the people of any given community act with respect to their health, bear very directly upon the amount of tuberculosis in the community. For careless and unwise health behavior increases the scattering of tuberculosis germs, and leads to more pulmonary disease, a poorer outlook with respect to cure, and greater numbers of relapses. Hygienic living and the right utilization of available medical services tend, on the other hand, to lessen the number of persons who have this disease.

The health conduct of people is, in turn, conditioned by their knowledge and attitudes concerning health. To bring about better control of tuberculosis and to cut down its ravages, knowledge about the disease must be disseminated among the public, and people must be motivated to conduct themselves in healthful ways. A vital part of the first line of defense against tuberculosis must therefore consist of popular health education. This is one of the cardinal necessities in seeking to eradicate tuberculosis.

In the light of the experience of the past four decades it is now recognized that health education of the lay public has all along constituted one of the most influential forces behind the whole modern health movement. Preventive medicine can fully achieve its goals only when the masses of people intelligently cooperate in guarding their health, and in carrying out the community programs sponsored by the medical profession and public health agencies. Nowhere has this popular adult health education brought more pronounced results than in the campaign against tuberculosis.

Agencies Supplying Health Education

Aside from such instruction as individual physicians give to some of their patients, the earliest popular tuberculosis education in Syracuse was started in 1906 by health officials and by the group of doctors and lay citizens that some years later developed into the Onondaga Health Association.*

The story has been the same throughout the nation. The first organized community programs of group and mass health education have in nearly all places come from voluntary health associations, particularly those supported through the sale of Christmas seals. The function of these agencies is not to treat persons who are ill, but to keep people from becoming ill. Their work is mainly educational.

One of the first steps under the Syracuse Health Demonstration, for which the Milbank Memorial Fund made its appropriations, had to do with the employment of health educators. Money from that foundation made possible the first

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* In cooperation with the late City Health Officer David M. Totman, the following persons, all now deceased, were especially active in launching this educational program: Dean John L. Heffron of the College of Medicine, Dr. A. Clifford Mercer, Giles H. Stilwell and Professor C. C. Bushnell.

appointments of a community health educator in the City Health Department, a health teaching supervisor in the same Department to work in parochial schools, a health teaching supervisor under the Board of Education, and a community health educator in the Onondaga Health Association. In accordance with the terms and conditions of the Demonstration, all of these positions were later transferred to local support. (The position of community health educator in the Health Department subsequently became vacant through death, and has not yet been refilled.) All four of these health education workers have dealt with a wide range of health subject-matter, in addition to that pertaining to tuberculosis.

While the City and the State Health Departments, the medical profession, staff members of the Sanatorium, and local schools have played their parts in supplying the local public with needed tuberculosis instruction, the agency which has provided, and still continues to provide, the largest share of it is the Onondaga Health Association.

School Health Teaching

It is customary to divide health education into (a) school health teaching, and (b) community health education.

Schools have no more important function than that of teaching their pupils correct health practices and attitudes. Under the Education Law all pupils in public schools must be given health instruction. The responsibility for providing this instruction rests mainly upon the classroom teachers. The role of the health teaching supervisor under the Board of Education, and also of the supervisor in the parochial schools, is primarily that of helping the teachers to keep their instruction scientifically sound, to follow approved methods, and to provide a healthful school environment.

The health teaching in local schools, as well as throughout the State, is largely limited to the first six grades, where it deals chiefly with the elementary facts of personal hygiene and desirable health habits and attitudes. Such instruction concerning tuberculosis as is furnished in high schools is given in the science classes, and also in the health classes in those senior high schools having such classes. In addition the subject is brought to the attention of eleventh and twelfth grade students in connection with the annual tuberculin testing surveys in these grades.

Community Health Education

Community health education addresses its messages to people after they have finished their schooling. While it gives part of its attention to out-of-school youths, it is essentially a phase of adult education.

Health education concerning tuberculosis is particularly important in these upper age brackets because, with the arrival of adulthood, people's health problems and responsibilities tend to loom larger. This is conspicuously true with regard to tuberculosis. Important as is the instruction about this disease that is given in local schools, it needs to be supplemented by a continuing program of health instruction and guidance on a community-wide basis.

Persons Needing Health Education About Tuberculosis

The local program of popular health education concerning tuberculosis

is intended to reach persons of all races, all occupations, and all economic and educational levels. While this tuberculosis education of the lay public should carry its message to all persons who may have the disease, as well as throughout all groups and neighborhoods where the disease is likely to develop, the needs will be only partly met unless there is a far wider coverage. In dealing with a social disease of this character - a disease which in one way or the other affects not only certain individuals and their families, but also the entire community - the education concerning the different phases of the problem must reach the largest possible number of persons of all kinds.

Not only those who already have, or may later develop, tuberculosis, but their relatives, their neighbors, their fellow workers and all others with whom they may at any time associate, should be made aware of the main facts and implications of the disease. For it profits little to furnish instruction to individuals here and there, if the teachings are later to be counteracted by ignorance and wrong attitudes on the part of other persons. Tuberculosis as a community problem can be successfully combated, only when there is a community-wide understanding concerning the disease.

Methods of Community Health Education

The principal channels through which the Onondaga Health Association carries on its community education include the following:

Addresses and group discussions
Sound films
Radio
Newspaper publicity
Pamphlet literature and loan library
Poster service
Mimeographed bulletins and circular letters
Exhibits
Personal conferenceswith leaders
Information service

While such vehicles of adult health education as newspaper publicity, the radio, and the showing of films in theatres reach larger numbers of persons at a time, the most effective form of health education is, as a rule, that which can focus attention upon the subject more directly and more personally. This is why small group meetings, featured by the showing of sound films, a short talk, and then an informal question-and-answer period, are so successful.

Meetings of this kind are being conducted by the Onondaga Health Association throughout the year in clubs, lodges, churches, youth assemblies, and before various other organizations and groups.

A form of visual education which has proven distinctly worthwhile in certain other cities, is the use of properly planned exhibits. Comparatively little in this field has as yet been done locally.

It is not enough that the health education should give people factual information. Least of all should the talks to lay audiences dwell upon the more strictly medical and technical phases. The emphasis should rather be upon what the lay individuals and groups themselves can and should do, both to safeguard their own health, and to build better health conditions in the community. The health education ought to be so conducted as to induce people to translate

the instruction into practical performance.

Content of Tuberculosis Health Education

The best health education is that which is intimately tied up with the experiences and actual needs of those to whom it is addressed. There are few subjects in which young persons, and men and women, are more interested than they are in their own health. Hence one of the most effective means of instructing people concerning the tuberculosis problem is to link it up with their personal health needs. Regardless of whether the persons composing an audience have already been tuberculin-tested and X-rayed or not, they should understand the general principles of healthful living and disease prevention. Along with this general instruction should go education concerning various phases of tuberculosis.

There is ordinarily much lag between the knowledge growing out of scientific progress in the sphere of medicine, and its application to everyday living. One of the purposes of health education is to overcome this lag, by converting the more important of these new scientific facts into such understandable terms as will make it possible for people to cooperate in the application of this new information. If Syracuse is to get rid of tuberculosis, the public must be disposed to make a maximum use of the lessons of modern medical and sanitary science and of the services which can be rendered by physicians.

This is not the place to recite the various points about tuberculosis that are being covered in the local health education program. People must be led to realize much more keenly than they now do, that tuberculosis is a germ disease, and that it is communicated from person to person. People must realize, too, that tuberculosis can exist in an individual for a long time without his feeling any symptoms whatever. They must learn that persons who seem perfectly well should, therefore, undergo periodic medical examinations, which should include a tuberculin test and a chest X-ray. One of the things which most hampers the progress of the tuberculosis campaign by keeping many persons from being examined, has been the widespread fear associated with this disease. Hence a particularly valuable service rendered by health education is to induce people to look at the problem more rationally. Another point constantly needing to be stressed in the local health education is that the earlier the disease is discovered, and the earlier its treatment is begun, the greater is the likelihood of cure and the less the risk of a later breakdown. The health education concerning this disease ought also to include a proportionate amount of attention to its public health aspects.

Inadequacy of the Present Health Education Program

An appraisal of the local tuberculosis health education now being carried on among men, women, and out-of-school youths in Syracuse and Onondaga County, can lead to no other conclusion than that it is covering the ground incompletely. Thousands of persons in the city who should receive this information and guidance are not being reached at all.

This is indicated by the statistics of the work done by the Onondaga Health Association. During the last three years the meetings which this organization conducted throughout Onondaga County have averaged 292 per year, with an average annual attendance of 21,260 persons. In Syracuse the meetings averaged 239, with an average yearly attendance of 16,102.

It should be noted, however, that half of these meetings have dealt with other health subjects. The meetings devoted to tuberculosis, held in all parts of Onondaga County, averaged 149 per year, and had an average annual attendance of 12,593. The tuberculosis meetings in Syracuse averaged 117 per year, and the attendance 9,232.

This is far from providing the needed coverage. This is further emphasized when it is known that nearly half of those to whom the messages about tuberculosis were carried, have in some years been high school students, and this in spite of the fact that tuberculosis is most likely to develop among adults. Moreover, while more men than women have tuberculosis, these educational programs reach many more women than men. The local tuberculosis education greatly needs to be intensified, too, among persons in low-income brackets, among industrial workers and certain other groups. Thousands of those most urgently in need of such instruction are not getting it at all.

One reason for this insufficient extent of the work is that the Onondaga Health Association is expected to carry on health education with reference to so many different health subjects. Its subject-matter includes syphilis, gonorrhea, heart disease, mental hygiene, cancer, pneumonia, diphtheria, nutrition, and other topics. This broadening in the scope of its group and mass educational activities is in keeping with the trends on the part of voluntary agencies in other places. The unfortunate aspect of the local situation is that the expansion of the scope of the Onondaga Health Association's program has not been accompanied by any corresponding increase in the size of its staff.

Obviously, a population of approximately 300,000 persons scattered throughout a county of some 1,600 square miles, cannot be expected to receive the amount, and the different kinds, of health education which it requires if the community has the services of just one community health educator.

Public Versus Private Auspices for Community Health Education

The responsibility for furnishing popular health education among the lay public belongs both to public and to private health agencies. Each of these types of agency is bound to find much more work for it to do than it can adequately handle. There are distinct advantages in having both official and non-official agencies participate in the program.

Health education stands out as one of the conspicuous examples of the American way of meeting human needs through the utilization of the initiative and enthusiasm of voluntary forces, cooperating with governmental agencies. While the powers and duties of official health agencies have undergone a marked expansion, there is reason to believe that, for a long time to come, voluntary health agencies will, and should, continue to function in the field of popular health education. Private organizations like the Onondaga Health Association are in a peculiarly favorable position for rendering effective services in this connection. They enjoy close and helpful tie-ups with voluntary agencies on the national and the state levels. They also have a freer hand than do official agencies in undertaking educational programs, in experimenting with different methods, and in recruiting the needed specially trained personnel.

Recommendations

21 - The local program of tuberculosis health education should be expanded and intensified. The position of community health educator in the Health Department, which became vacant during the depression, should be re-created. The health education activities of the Onondaga Health Association, which are dependent for their support upon Christmas Seal and Community Chest moneys, should be better financed, and the Association should have the services of one or more additional community health educators to carry on mass and group tuberculosis education.

PART VII. - PREVENTIVE MEASURES

It is not enough that people be protected against exposure to tuberculosis germs; they need, at the same time, to keep up their physical resistance. This is true of the individual. It holds true also for the community as a whole.

One of the observations made by Dr. Edward Trudeau, the great pioneer in the warfare against the "white plague," was that tuberculosis is a "soil disease." By this he meant that the seeds of the disease (the tubercle bacilli) produce the disease only when they find lodgment in the right kind of living soil. While tuberculosis germs are the direct cause of tuberculosis, certain environmental factors and certain forms of health conduct contribute toward making the body either a favorable ground, or an unfavorable ground, for its development.

Certain of these social, economic and other factors have the effect, in other words, of increasing susceptibility to the disease. On the other hand, other conditions and forces fortify people against its inroads, and may therefore be regarded as preventive influences. The fact that certain groups and classes of persons have a large amount of tuberculosis, while others have little of it, is largely due to the differences in their economic resources and in their standards and manner of living.

Any given community can to a considerable degree exercise control over some of these environmental and cultural factors. To that extent it can control its local tuberculosis problem. The community that is vigilant and maintains needed community measures helps to lessen the prevalence of the disease. The community that fails to keep up proper safeguards, and that lets the standards of living or the adequacy or quality of its essential services become lowered, tends, on the other hand, to pave the way for worse tuberculosis conditions.

This Report on the problem of eradicating tuberculosis from Syracuse would therefore be incomplete without a brief mention of the more important of these preventive measures. In naming them, the Committee has no thought of advocating any program of action; it merely calls attention to the facts which are stated below.

(a) Proper economic standards of living have long been recognized to be of basic importance in protecting people against tuberculosis. In families where relief is essential, it should be adequate in amount.

(b) Proper nutrition, by which is meant not only a sufficient amount of food, but a diet that is properly balanced, is necessary for keeping up resistance against tuberculosis. Such increases in the disease as have occurred in the past as an accompaniment or an aftermath of war, have always been intimately associated with shortages in essential food elements. It is not enough that people have a sufficient quantity of food; their selection of the needed variety of food should be in keeping with modern knowledge about nutrition.

(c) Cleanly habits and other approved hygienic standards of living play an influential part in keeping tuberculosis from spreading.

(d) Another side of personal hygiene which has far-reaching effects is the securing of sufficient rest and sleep. Even such a desirable thing as

recreation, if carried to an extreme, can be deleterious.

(e) Satisfactory housing is another influential element in the control of tuberculosis. Over-crowding as to the number of occupants per room, and shortcomings in essential living facilities, are particularly to be avoided. Anything that weakens morale or makes for carelessness in the home may ultimately prove harmful in terms of physical health.

(f) Favorable working conditions, including reasonable working hours, avoidance of undue strain and fatigue, and observance of sanitary requirements in the place of employment also have their bearings on the health of the community and on the amount of tuberculosis.

(g) The maintenance of ample and efficient medical, nursing, hospital, convalescent and health education facilities and services, as well as the intelligent use of such resources, are of strategic importance in keeping people in proper physical condition, and in preventing tuberculosis from getting a hold on them.

(h) Properly implemented public welfare agencies, as well as competent other social agencies, which can help sub-marginal families and individuals when in difficulty, must likewise be kept up as part of the community armament against this disease.

In difficult times like these, special efforts should be made to conserve the standards and services which have up to now prevailed with regard to the foregoing items. To suffer any letting down of these defenses against tuberculosis might easily invite increases in its prevalence.

Recommendations

22 - Such factors as proper economic and social standards of living, proper nutrition, satisfactory housing, healthful working conditions, competent services on the part of social agencies, and adequate resources for medical care, are essential means of enabling people of this city to keep up their resistance against the development of tuberculosis. Especially under war conditions it will be important to avoid, in so far as possible, any lowering of the standards in these regards or any letting up in such services.